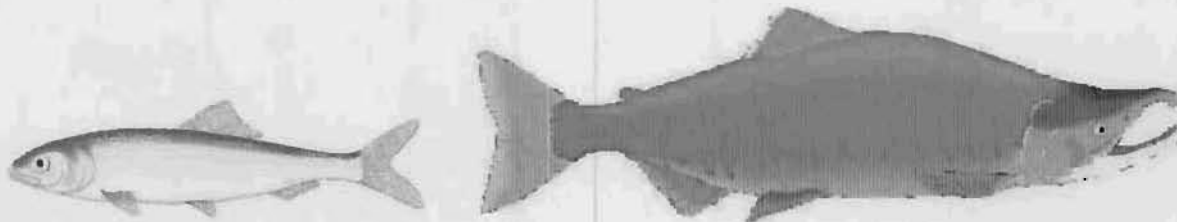




State of Alaska
DEPARTMENT of
FISH and GAME

1999 LOWER COOK INLET
ANNUAL FINFISH MANAGEMENT
REPORT



Regional Information Report No. 2A00-17

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March, 2000

1999 LOWER COOK INLET ANNUAL FINFISH MANAGEMENT REPORT



by

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Regional Information Report¹ 2A00-17

Alaska Department of Fish and Game
Division of Commercial Fisheries Central Region
333 Raspberry Road
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March, 2000

¹ Contribution from the Homer area office. The Regional Information Report Series was established in 1987 to provide an information access system for all unpublished divisional reports. These reports frequently serve diverse ad hoc informational purposes or archive basic uninterpreted data. To accommodate timely reporting of recently collected information, reports in this series undergo only limited internal review and may contain preliminary data; this information may be subsequently finalized and published in the formal literature. Consequently, these reports should not be cited without prior approval of the author(s) or the Division of Commercial Fisheries.

ACKNOWLEDGMENTS

1999 DIVISION OF COMMERCIAL FISHERIES STAFF

The finfish operations for the Division of Commercial Fisheries in Lower Cook Inlet employed six permanent employees, and 11 permanent-seasonal employees, and one volunteer employee in various area management and research programs during the 1999 season. Appreciation is extended to all personnel for a successful program during 1999.

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ANNUAL MANAGEMENT REPORT
LOWER COOK INLET
1999

COMMERCIAL SALMON FISHERY

INTRODUCTION

The Lower Cook Inlet (LCI) management area is comprised of all waters west of the longitude of Cape Fairfield, north of the latitude of Cape Douglas, and south of the latitude of Anchor Point, and is divided into five fishing districts (Figure 1). The Barren Islands District is the only non-salmon fishing district, with the remaining districts (Southern, Outer, Eastern, and Kamishak Bay) separated into approximately 40 subdistricts and sections to facilitate management of discrete stocks of salmon and herring.

The 1999 LCI salmon harvest of 1.635 million fish (Table 1, Figure 9) was the fifth highest during this decade and was nearly identical to the 20-year average (Appendix Table 5). Unfortunately, the overall harvest represented less than 40% of the preseason forecast. However, a slight upturn in the economic forces of worldwide salmon markets yielded a LCI exvessel value of just over \$3.0 million (Table 7), making the value of the 1999 harvest the highest during this decade (Appendix Table 2). Seine fishing effort continued an annual increase over the previous two years, with 45 permit holders making deliveries (Appendix Table 1), while the number of active set gillnet permits dropped to 20, the lowest since 1994.

Once again, LCI commercial salmon harvests in 1999 relied heavily on the success of hatchery and enhanced fish production. Nearly 85% of the sockeye salmon harvest in both numbers of fish and exvessel value was attributed to joint Alaska Department of Fish and Game (ADF&G) and Cook Inlet Aquaculture Association (CIAA) lake stocking and fertilization projects. These projects were conducted at Leisure and Hazel Lakes in the Southern District, Kirschner and Bruin Lakes in the Kamishak Bay District, and Bear and Grouse Lakes in the Eastern District.

Additionally, sockeye salmon produced by the Chugach Regional Resources Commission (CRRC) enhancement project at English Bay Lakes once again provided subsistence harvests for the villages of Nanwalek and Port Graham in the Southern District.

Pink salmon production from Tutka Hatchery, now operated by CIAA, was disappointing, with an overall return of 1.26 million fish (Table 9). This total represented only 40% of the preseason projection. As has been the case since hatchery programs were taken over by private non-profit (PNP) corporations in LCI, a significant portion of the salmon harvest was utilized as hatchery cost recovery to recoup expenses incurred by the various stocking and enhancement projects throughout the management area. Over 60% of the total salmon harvest (Table 7) in numbers of fish was taken by CIAA and CRRC to support the lake stocking programs and Tutka Hatchery operations, representing about one-fourth of the exvessel value of the LCI salmon fishery. Natural returns bound for LCI drainages contributed only a very small percentage to commercial harvests in 1999, primarily from East Nuka Bay in the Outer District.

Several notable factors continued to affect the amount and distribution of seine effort, and ensuing harvest of salmon, in LCI during 1999. The first was the policy adopted in 1994 by major processors regarding tender service. Prior to that time processors routinely stationed a tender (or tenders) in remote districts in anticipation of salmon harvests, even when run strengths and catches were marginal. However, when the practice was abandoned seiners were forced to devise their own means to transport fish from these remote areas to a processing plant in Homer or elsewhere. Due to equipment limitations and the high cost of contracting out for tendering services, a significant number of fishermen were unable to fish in remote areas, while some retained the flexibility to fish these traditional areas because of onboard chilling equipment.

The second influential element affecting harvest and effort revolved around world wide market situations. Despite higher prices in 1999 compared to recent seasons, prices for pink salmon (the most numerous species in LCI) in particular remained depressed. This pricing structure often dictated the fishing strategy of individual fishermen, even to the point of total non-participation.

Coupled with the lack of tender service in remote districts, low prices may have kept effort and harvest artificially low.

PRESEASON FORECAST

The projected 1999 LCI all-species salmon harvest of 4.2 million fish was over two and one-half times the 20-year average. This optimism resulted from the anticipated strength of odd-year-dominant pink returns, both hatchery-produced and natural, as well as the expected success of various sockeye lake stocking programs. Formal total run forecasts for natural salmon returns other than pink salmon were not prepared because escapement and age-weight-length data are limited for those species. However, catch projections were calculated from relative estimates of parental run size, average age composition data, and recent relative productivity trends. Harvest projections and actual catches for all species in 1999 are listed in the following table:

| SPECIES | PROJECTED HARVEST | ACTUAL HARVEST | 1979-1998 AVERAGE |
|---------|----------------------|-------------------|----------------------|
| Chinook | 1,300 | 1,764 | 1,305 |
| Sockeye | 399,700 | 476,779 | 218,189 |
| Coho | 14,800 | 8,033 | 14,874 |
| Pink | 3,788,500 | 1,140,488 | 1,308,818 |
| Chum | 10,400 | 7,941 | 90,393 |
| TOTAL | 4,214,700 | 1,635,005 | 1,633,578 |

Relatively strong sockeye returns were anticipated in all areas. Enhanced runs to Leisure and Hazel Lakes in the Southern District, Kirschner Lake in the Kamishak Bay District, and Bear and Grouse Lakes in the Eastern District, were expected to comprise the bulk of the sockeye returns. It should be noted that the Grouse Lake return was specifically designated for hatchery cost recovery. The English Bay Lakes system in the Southern District, having produced increasingly important sockeye returns recently, was not expected to produce a commercially harvestable surplus due to high juvenile mortalities. Although Chenik Lake in the Kamishak Bay

District benefited from regular fry stocking and intermittent fertilization during past years, adult sockeye returns in 1999 were once again predicted to be very poor due to the lingering effects of an epizootic of Infectious Hematopoietic Necrosis Virus (IHNV) within the system. As a result, the entire Chenik run was to be protected for escapement. Bruin and Ursus Lakes in the Kamishak Bay District were expected to produce only minimal sockeye returns in 1999 due to a discontinuation of stocking at those systems.

Returns to the Tutka Bay Hatchery were once again expected to be the mainstay of the pink salmon fishery, with a forecasted harvest totaling over 3.0 million fish. These fish were anticipated as a result of 90.0 million fry released from Tutka Hatchery in 1998 (Appendix Table 31), and typical ocean survival rates for odd-year runs were expected to produce an overall adult return approaching 3.2 million fish.

Generally strong 1997 pink salmon escapements to major systems contributed to a harvest projection of 726,500 naturally produced pinks throughout the entire LCI management area this season. Port Dick, Windy Bay, and Nuka Island in the Outer District, and Bruin Bay and Ursus/Rocky Coves in the Kamishak Bay District, were forecasted to provide the largest potential for harvestable surpluses, but fishing effort in these remote districts was questionable.

Significant chum salmon harvests appeared unlikely again in 1999 since major LCI systems experienced relatively fair to poor escapements during the 1994 and 1995 parent years. Additionally, a trend of weak returns over the past nine seasons suggested that the 1999 chum return would be weak as well.

1999 SUMMARY BY SPECIES

Chinook Salmon

The harvest of chinook salmon, not normally a commercially important species in LCI, was approximately 35% greater than the 20-year average at 1,764 fish (Table 2, Appendix Table 12). Virtually all of the catch came from the Southern District and can be primarily attributed to enhanced production at Halibut Cove Lagoon and Seldovia Bay. Set gillnetters accounted for about 85% of the LCI chinook catch, with purse seiners taking the remaining 15%.

Sockeye Salmon

The 1999 LCI sockeye salmon harvest of 477,000 fish (Figure 10, Table 3) exceeded the preseason forecast by roughly 20% and set a new record catch for this species in LCI (Appendix Table 13). Sockeyes accounted for only about one-quarter of the LCI salmon harvest in total numbers of fish, yet provided over 80% of the exvessel value of the entire salmon fishery this season (Table 7). The 1999 LCI commercial sockeye harvest was characterized by considerably greater than anticipated contributions from Southern District enhancement programs at Leisure and Hazel Lakes, as well as a significantly larger return to Grouse Lake in the Eastern District compared to recent years. As was the case during the past two seasons, non-local stocks were thought to have intermixed with local stocks while migrating through the Southern District terminal harvest areas, providing additional sockeyes for harvest. Elsewhere in LCI, natural returns of sockeye salmon provided harvestable surpluses in both the Outer and Kamishak Bay Districts.

Returns to enhancement sites, which typically have provided the bulk of the LCI sockeye catch, were considered good in 1999. In the Southern District, harvests of enhanced runs of sockeye salmon returning to Leisure and Hazel Lakes were predicted to total 104,000 fish combined. However, the estimated combined total of 219,000 fish (Figure 11, Appendix Table 15) produced as a result of these two enhancement projects provided almost half of the

LCI sockeye total and was approximately double the preseason forecast. This year's harvest figure represents the highest combined total since adults began returning to Hazel Lake in 1991 (prior to that year, only Leisure Lake sockeyes contributed to the harvests).

Also in the Southern District, the sockeye run to English Bay Lakes achieved an escapement within the desired range for the fifth consecutive year but only the sixth time in the last 20 years. Unfortunately, the return was expectedly weak due to high juvenile mortalities and, as a result, the entire Port Graham Subdistrict (including the English Bay Section) was kept closed to commercial fishing for the season. The subsistence fishery within the subdistrict remained open, however, and sockeyes returning to English Bay Lakes likely contributed to subsistence catches in the villages of Port Graham and Nanwalek. The continued viability of the sockeye return to this system can be attributed to the success of an ongoing rehabilitation project originally initiated by ADF&G in the late 1980's and presently being conducted by Chugach Regional Resources Commission (CRRC) in conjunction with the village of Nanwalek.

In the Kamishak Bay District, enhanced returns to Kirschner and Bruin Lakes produced a combined harvest of nearly 40,000 sockeyes (Table 3), exceeding the preseason harvest forecast of 30,000 fish. The return to a former enhancement site at Ursus Lake was weak as predicted since the success of that stocking program has historically failed to meet the theorized potential. No fishing was allowed at Chenik Lake in the Kamishak Bay District since that return was expected to be poor due to the after-effects of an outbreak of the naturally occurring viral disease IHN earlier this decade. The outbreak caused increased mortality to young salmon, subsequently resulting in weak adult returns.

At Bear Lake in Resurrection Bay of the Eastern District, a catch of over 31,000 sockeyes fell just shy of the harvest forecast of 39,000 sockeyes. The return to nearby Grouse Lake, with a projected harvest of 157,000 fish, failed to achieve the forecast but still was the largest return to date at an estimated 104,000 fish.

The LCI management area has only four systems with significant naturally occurring sockeye salmon runs, and all four achieved their escapement goals in 1999. In the Outer District, escapement goals at both Delight and Desire Lakes, identical at 10,000 sockeyes each, were achieved, with Desire Lake totaling 14,600 fish and Delight Lake 17,000 (Appendix Table 23). The strong returns were reflected in the seine harvest in East Nuka Bay, totaling over 51,000 sockeyes (Table 3). Returns to Delusion (Ecstasy) Lakes, a recently formed glacial lake system in East Nuka Bay which supported no documented salmon run prior to the mid-1980's, had a peak aerial escapement estimate of 1,100 sockeye salmon in 1999. Waters of Aialik Bay, including Aialik Lagoon, in the Eastern District were opened to fishing in mid-July, but by this time the sockeye return had peaked and little effort occurred, resulting in a harvest of less than 100 sockeyes for the season (Table 3). Still, sufficient numbers of fish entered the system to achieve the midpoint of the escapement goal range (Table 3, Appendix Table 23). At Mikfik Lake in the Kamishak Bay District, a very strong return resulted in an escapement estimated at over 15,000 sockeyes (5-7,000 goal range), with an additional 7,200 fish harvested by the seine fleet.

Coho Salmon

The commercial harvest of 8,000 coho salmon (Table 4) in 1999 was the second lowest this decade, representing only 60% of the recent 10-year average (Appendix Table 17). As is typical, the majority of the harvest came from hatchery cost recovery operations at Bear Lake and entries into the Seward Silver Salmon Derby, both in the Eastern District. Coho run assessment in LCI is limited, with commercial, sport, and personal use harvests providing the best indicators of run strength. Based on these indicators, returns during 1999 were considered only fair. Also as is common, the combination of low prices and the lack of remote tender service discouraged the majority of the seine fleet from targeting cohos late in the season, especially in the Kamishak Bay District. Thus the commercial harvest may not have been truly indicative of run strengths. Two aerial surveys were flown specifically for coho salmon assessment in September, at Clearwater Slough in the Northshore Subdistrict of

the Southern District. The resulting peak index count of over 600 cohos indicated good escapement at that system.

Pink Salmon

Returns of pink salmon, usually the dominant species in numbers of commercially harvested fish in LCI, were considered poor for an even year, with an overall harvest of 1.14 million fish (Figure 12, Table 5). This number represents the fifth highest commercial catch during this decade but was less than half of the two most recent odd-year harvests (Appendix Table 18). The majority of the catch was taken in the Southern District (Table 5, Appendix Table 18) as a direct result of Tutka Hatchery production. However, three-fourths of the Southern District total, or about 858,000 fish, was utilized for Tutka Hatchery cost recovery (Tables 1 and 5), with an additional 152,000 fish taken for hatchery brood stock purposes (Table 9). The estimated overall hatchery return, including escapement into Tutka Creek, brood stock, commercially harvested fish, and sport harvest, was 1.26 million pinks (Table 9), falling significantly short of the preseason projection of over 3.0 million fish. The 1999 survival rate of 1.4% was considered well below average for this facility.

The Outer District produced the greatest contribution of natural pinks to LCI catches, but with a total harvest of 32,500 fish (Table 5, Appendix Table 18), the percentage of the overall pink total was minimal. The entire harvest came as incidental catch during the directed sockeye fishery in East Nuka Bay (Delight/Desire Lakes). Aialik Bay in the Eastern District, which in some years has produced good late season catches of pinks (primarily of Prince William Sound origin), experienced a harvest of only 1,900 fish (Table 5). In the Kamishak Bay District, no pink harvest occurred again in 1999, as returns there were extremely weak. Pink salmon escapements into major systems throughout LCI were considered exceptionally poor for an odd year as only one primary system achieved its escapement goal (Appendix Table 24). However, even if runs had been strong, the lack of remote tender service and low prices would likely have suppressed directed effort towards natural returns of pink salmon throughout the management area.

Chum Salmon

The 1999 commercial chum salmon harvest of 7,900 fish (Table 6) represented only about 9% of the 20-year average and marked the eleventh successive below-average season in Lower Cook Inlet (Figure 13, Appendix Table 21). Still, the total was the fourth highest this decade and was approximately 80% of the recent 10-year average. The low numbers were anticipated based on the recent trend of weak returns, and conservative fishing schedules were implemented in an effort to secure adequate escapements and reverse the decline in chum salmon numbers. The conservative strategy was hardly necessary, however, as low prices coupled with the lack of tender service in remote districts once again discouraged the fleet from targeting this species. Consequently, the majority of monitored systems achieved their minimum escapement goals. One major system, McNeil River in the Kamishak Bay District, failed to attain the lower end of its escapement goal range of 20,000 to 40,000 fish for the first time since 1996 (Appendix Table 25). Other systems that failed to meet their chum goals in 1999 included Rocky River and Port Dick (head end) Creek in the Outer District, and Big and Little Kamishak Rivers in the Kamishak Bay District.

1999 EXVESSEL VALUE

The estimated exvessel value of the 1999 salmon harvest in LCI, not including any postseason adjustments in price paid to fishermen, was approximately \$3.0 million (Table 7, Appendix Table 2), making it the highest since 1988. Purse seine gear in the common property fishery, which normally accounts for the majority of the catch, comprised nearly \$1.97 million or about two-thirds of the overall total (Table 7), while set gillnets accounted for \$315,000 or 10%. An estimated \$732,000, or about one-fourth of the entire exvessel value of the LCI salmon fishery, was utilized for hatchery cost recovery purposes. Average prices paid to fishermen in 1999, not including any postseason adjustments, were as follows: chinook - \$1.96/pound; sockeye - \$1.22/pound; coho - \$0.45/pound; pink - \$0.16/pound; and chum - \$0.32/pound (Appendix Table 3).

1999 DISTRICT INSEASON MANAGEMENT SUMMARIES

Southern District

Set Gillnet Fishery

An Area H set gillnet permit is valid for fishing in any part of Cook Inlet (Upper or Lower), but there are only five beach areas in LCI, all located along the south shore of Kachemak Bay in the Southern District, where set gillnets may be used (Figure 2). The limited area provides only enough productive fishing sites to accommodate approximately 25 set net permits.

The 1999 LCI set gillnet harvest totaled 40,200 fish, the lowest catch since 1993 and about 30% less than the recent 10-year average (Appendix Table 7). Approximately 69% of the catch was comprised of sockeyes, followed by pinks at 13%. For comparison, these figures are significantly different than the historical proportions, where typical species composition in the commercial set gillnet fishery over the past decade has been 48% sockeyes, 40% pinks, 5% cohos, 5% chums, and 2% chinooks. Catches of chinook salmon, at 1,500 fish, were the second highest on record and about 22% greater than the recent 10-year average. Enhancement efforts directed at recreational fisheries in Seldovia Bay and Halibut Cove Lagoon are primarily responsible for the commercial gillnet chinook catch during 1999.

For the first season since 1994, the commercial set gillnet fishery in the Port Graham Subdistrict, including the English Bay Section, was kept closed in order to protect sockeyes returning to English Bay Lakes. Due to high juvenile mortalities encountered in the enhancement program, this year's adult return was only projected to total about 22,000 fish. With an escapement goal of 15,000 sockeyes established for this system, commercial exploitation was not justified. However, the subsistence gillnet fishery in the two sections was allowed to proceed on the normal fishing schedule to help fulfill the villages' salmon subsistence requirements. Once the escapement goal was achieved, Port Graham Hatchery Corporation (PGHC) harvested just under 700 sockeyes for cost recovery (Table 3) in the only

such effort for the season. The escapement figures for English Bay Lakes continued the recent trend of meeting the system's spawning requirements and once again demonstrated the potential for even greater returns in future years.

LCI set gillnet fishing effort in 1999 decreased for the first time in the past four seasons, with a total of 20 set gillnet permits actively fished. This was only slightly less than the recent 10-year average but was a downturn from a stable trend experienced between 1995 and 1998 (Appendix Table 1).

Seine Fishery

Sockeye Salmon

The overall catch of sockeye salmon by all gear types, at 243,400 fish, was the second highest for the Southern District during the last 20 years (Appendix Table 13) and was over 60% greater than the recent 10-year average. Purse seiners in the common property fishery accounted for over three-fourths of the sockeye salmon landed in the district in 1999 (Table 1).

As in recent years, waters of China Poot Bay and Halibut Cove Subdistricts, and the outer waters of the Tutka Bay Subdistrict, were opened to seining five days per week beginning Monday, June 21, to target returns to Leisure and Hazel Lakes. Within these subdistricts, however, waters of the China Poot and Hazel Lake Special Harvest Areas (SHA's; Figure 3) were opened only to authorized agents of CIAA at this time, seven days per week, for the express purpose of hatchery cost recovery. They were to be kept closed to the common property commercial fishery until the preseason revenue goal established for each SHA was achieved.

Preseason combined harvest projections for returns to the Leisure and Hazel Lakes stocking projects were estimated at 104,000 fish. The actual commercial harvest of fish returning to the two sites was estimated at over 219,000 fish (Figure 11, Appendix Table 15), comprising

46% of the total LCI sockeye salmon harvest (Table 3). Because of the geographic proximity of these two projects, the overlapping area of harvest, and the lack of tagging, no definitive assessment of separate returns to each system can be established. However, fish returning as a result of these two projects undoubtedly contributed to seine catches in the Halibut Cove and Tutka Bay Subdistricts, as well as those in China Poot Bay Subdistrict. It was estimated that personal use dip net fishermen and sport fishermen harvested another 6,200 sockeyes at the head of China Poot Bay based on average catches over the past 10 years. The 1999 total return from both projects was estimated at 226,000 sockeyes (Appendix Table 15). Although the disparity between the preseason forecast and the actual return cannot be fully explained, higher than average fresh and/or salt water survival was likely responsible.

As outlined in the Trail Lakes Hatchery Annual Management Plan (AMP) prior to the season, the revenue goal necessary to meet operational expenses incurred in LCI sockeye salmon lake stocking projects was set at \$130,000. This figure was to be split amongst locations as follows: 60% from combined China Poot and Hazel Lake SHA's, both in the Southern District, and 40% from the Kirschner and Bruin Lakes SHA's in the Kamishak Bay District. No cost recovery was planned at Chenik Lake in 1999 since weak returns were expected. Cost recovery harvests inside the China Poot and Hazel Lake SHA's (Figure 3) were to occur at CIAA's discretion early in the runs since harvests could take place without interference or competition from the fleet at large. Projected harvests of 24,600 sockeyes from the China Poot and Hazel Lake SHA's were necessary to achieve the combined goal of \$78,800 for these two areas, assuming an average price of \$0.80 per pound and an average weight of 4.0 pounds per fish. As previously described, these SHA's were to remain closed to common property seining until the combined goal established for the two areas was achieved.

As in past years, CIAA once again contracted the Cook Inlet Seiners Association (CISA) to undertake sockeye cost recovery in LCI for the 1999 season. CISA enlisted volunteers from within the fleet, and the first cost recovery harvest in the China Poot Subdistrict occurred on July 7 in the Neptune Bay SHA, but the catch was minimal, netting only 49 fish. By that time, a firm contract price for sockeyes had been established at \$1.10 per pound, and with

initial average weights running around 4.5 pounds per fish, the number of fish necessary to achieve the revenue goal was revised downward to a new combined total of approximately 15,000 fish.

Cost recovery harvests continued over the next eleven days, with all conducted in the China Poot SHA as the sockeye run gained strength. By July 16, cost recovery efforts had totaled 7,000 fish, and with higher than expected average weights for sockeyes from both SHA's, the cumulative harvest approached 39,000 pounds. At a price of \$1.10 per pound, this figure represented over half of the desired revenue goal. The next day, the peak cost recovery harvest of the season occurred when more than 8,900 sockeyes were landed in the China Poot SHA. This brought the cumulative revenue generated by cost recovery efforts to approximately \$77,000. The final harvest took place on the morning of July 18, bringing the cumulative cost recovery total to just over 16,000 fish, worth an estimated \$78,700 and essentially achieving the revenue goal. As a result, the China Poot and Hazel Lakes SHA's were closed to cost recovery harvest on July 18, and both sections were opened to common property seining seven days per week beginning Monday, July 19. A small portion of the China Poot Section near China Poot Creek remained closed to commercial fishing (on weekends only) in deference to the heavy sport/personal use traffic in the vicinity.

Common property seine catches in China Poot Subdistrict began modestly at the end of June, but run strength truly started to build around July 8 and catches followed commensurately. Common property harvests in China Poot Subdistrict peaked on July 19-20, with a combined total of nearly 57,000 sockeyes taken by about 15-20 vessels in the two sections. The total catch that day was split equally between the China Poot and Hazel Lake Sections. China Poot Section daily catches remained steady for the next week at roughly 2,000 – 4,000 sockeyes per day, while those of Hazel Lake remained at a similar daily level for about six days. Catches in both sections then dropped to a lower but still steady level of 800 – 1,700 fish daily for another week. After that harvests decreased gradually, with the last landing from both sections made on August 9. The cumulative commercial catch in the two sections was 154,400 sockeyes (Table 3), with about 60% taken in the China Poot Section. Seine effort for

sockeyes within adjacent waters of Tutka Bay Subdistrict added an additional 64,600 sockeyes to the commercial seine harvests. Although no tag/recovery efforts were conducted this season, it must be pointed out that some portion of the sockeyes taken in the Tutka Bay Subdistrict were believed to be returning to the Tutka Hatchery as the result of low level smolt releases in prior years.

Pink Salmon

Returns of pink salmon to the Tutka Bay Hatchery contributed to an overall Southern District harvest of 1.105 million fish (Table 5, Appendix Table 18), equaling the recent 10-year average and representing the sixth highest catch over the past 20 years. However, the hatchery return was extremely disappointing as it was less than half of the preseason forecast of over 3.0 million fish.

Waters of Tutka Bay Subdistrict outside of Tutka Bay proper were open to commercial seining five days per week beginning June 21, as has been the case in recent years. The open waters consisted of those waters offshore of a line running from the "rock quarry" on the north shore of Tutka Bay to the Tutka Bay Lodge on the south shore (Figure 4). Waters within the Tutka Bay SHA (Figure 4) were open to hatchery brood stock and cost recovery harvest by authorized agents of CIAA on a continuous basis, as established in the Tutka Hatchery Annual Management Plan, also beginning June 21. The plan called for hatchery incubators to be filled to maximum capacity if possible, and excess fish beyond brood stock and natural escapement requirements were to be harvested for cost recovery to help offset operational expenses, estimated at \$385,600 for FY99. A minimum of 160,000 fish (120,000 females) was desired for hatchery brood stock in order to achieve the goal of 125 million eggs, and an additional 6-10,000 pinks were needed to meet the natural spawning escapement goal for Tutka Creek.

At a projected average weight of 2.8 pounds and a preseason contract price of \$0.185 per pound for cost recovery fish, about one-quarter of the overall forecasted hatchery return would

be needed to meet the revenue goal. If the return came in as projected, over 2.3 million fish would potentially be available for common property harvest.

The contracted cost recovery vessel and crew was available and ready to begin harvesting in early July, but the pink run was late and the first harvest did not occur until July 12, inside Tutka Lagoon. A second catcher boat, to work waters outside Tutka Lagoon as was the case in some previous years, was kept "on call" should the run attain the strength to justify additional effort. The single primary cost recovery vessel fished on a daily basis for three consecutive days, but because the run was not as strong as expected, no significant "buildup" of fish was occurring inside the lagoon. As a result, cost recovery effort was suspended for about a week to wait for larger numbers of fish. During this time, brood stock collection was initiated in order to begin filling net pens.

Cost recovery resumed on July 22 and continued on a daily basis through August 6. The peak daily cost recovery harvest occurred on July 27, very late by historical standards, with a total of over 201,000 pinks taken. Daily catches averaged just over 109,000 pinks during the period July 26 – August 2. All fishing occurred within Tutka Lagoon, and the one vessel contracted by the hatchery was able to maintain a consistent, steady pace that prevented any significant buildups during the season. The "backup" vessel was not required during any part of the hatchery harvesting operations.

Pinks harvested for cost recovery averaged only 2.4 pounds per fish, creating an upward revision of the numbers required to achieve the revenue goal. By August 6, approximately 844,400 pinks, or about 2.055 million pounds, had been harvested for cost recovery purposes. With the contract price of \$0.185 still in place, CIAA officials indicated that the revenue goal would be reached the next day. Therefore, waters of Tutka SHA (except for those of Tutka Lagoon) were closed to hatchery fishing beginning August 7, while all waters of Tutka Bay Subdistrict, except for Tutka Lagoon, were opened to commercial seining seven days per week. This strategy allowed the opportunity for seiners to harvest surplus fish while still allowing limited hatchery cost recovery fishing and brood stock collection. The final cost

recovery harvest occurred on August 6, resulting in a cumulative hatchery cost recovery catch of 857,900 pinks for the season (Table 9). An additional 151,900 fish were harvested for brood stock.

Commercial seine landings of pinks in Tutka Subdistrict (outside of the SHA) began in early July, but numbers were disappointingly small as the run was late arriving. Catches began to increase on July 14, but not in totals suggested by the preseason forecast. As the month wore on, it became unquestionably apparent that the hatchery return was much weaker than predicted. Fishing continued into August, with the peak daily harvest and effort occurring on July 26, when 11 seiners harvested just over 41,000 pinks. The weak return likely discouraged effort throughout the season. The total commercial seine catch of pink salmon in Tutka Bay Subdistrict amounted to 219,200 fish, while set gillnetters harvested an additional 3,100 pinks.

The estimated pink salmon escapement of 28,000 fish (Table 5, Appendix Table 24) into Tutka Creek exceeded the desired range of 6-10,000 fish. As in recent years, this escapement was thought to contain a disproportionately high percentage of males discarded during hatchery sorting operations. The total return of pinks to Tutka Hatchery, including commercial, cost recovery, brood stock, and sport harvest, as well as escapement, was estimated at 1.262 million fish (Table 9), representing only 40% the preseason forecast.

At Port Graham, the fire that destroyed the Port Graham cannery and hatchery in early 1998 resulted in no release of fry that spring, therefore the Port Graham Hatchery Corporation (PGHC) forecasted no adult pink salmon returning to the facility this season. As a result, all fish for brood stock purposes were expected to come from Port Graham River. Although 16,000 fish were desired for brood stock, the hatchery realized that meeting its egg-take goal would be unlikely given the recent trend of weak returns to Port Graham River. With a desired escapement range of 20,000 to 40,000 fish at Port Graham River, and a forecast of 7,000 to 40,000 fish returning, few wild fish could likely be harvested even if the run materialized. The egg removal schedule for Port Graham River was identical to previous years as outlined in the Port Graham Hatchery Annual Management Plan (AMP). Once the

established threshold (6,000 pinks) for wild escapement into Port Graham River was identified by the staff ground survey team, brood stock removal could begin

Given the poor outlook for pinks returning to Port Graham River, PGHC sought an alternative brood stock source, with the most logical candidate represented by nearby English Bay River. Inseason, it quickly became obvious that the return to Port Graham River was dismal, failing to achieve the threshold necessary to begin brood stock collection. As a result, the Department issued a one-time only permit to PGHC for pink salmon brood stock collection from English Bay River after the Nanwalek Indian Reorganization Act (IRA) Council agreed to allow this activity (assuming sufficient run strength). Although little historical escapement data was available for English Bay River, the staff developed an egg removal schedule specifying a threshold of 3,000 pinks necessary before brood stock collection could be initiated.

The established threshold at English Bay River was identified during a stream survey on August 30 and brood stock collection began about a week later. A total of 1,270 pinks were harvested from English Bay River for the purpose of hatchery brood stock, resulting in the collection of an estimated 1.3 million eggs.

The final escapement into Port Graham River, estimated at 9,700 pinks, fell short of the desired range of 20,000 to 40,000 fish for the eighth consecutive year. The English Bay River pink escapement was estimated at 17,500 fish (after accounting for the removal of 1,270 pinks for Port Graham Hatchery brood stock). The commercial fishery in Port Graham Subdistrict, having been closed earlier in the season to protect sockeyes returning to English Bay Lakes, was never opened due to the weakness of the wild pink return and absence of the hatchery return. As a result, no commercial harvest occurred in the subdistrict.

Returns of wild pink salmon stocks to other systems in the Southern District were generally miserable as indicated by ground survey escapement counts, therefore no directed openings were allowed. No monitored system, with the exception of Tutka Creek, attained its established escapement goal this season (Table 5, Appendix Table 24).

Other Species

Southern District chum salmon returns were poor for an eleventh consecutive year. Nonetheless, the chum harvest of 4,600 fish (Table 6) represented the highest total since 1988 and surpassed the recent 10-year average for the district (Appendix Table 21). Set gillnets accounted for over 90% of the total, split almost equally between Tutka Bay, Barabara Creek, and Seldovia Bay Subdistricts (Table 6). Escapements into Southern District chum systems were generally fair to poor, although an escapement within the desired range was achieved at Port Graham River for the third consecutive season (Appendix Table 25).

Although minor in total numbers of fish, the majority of the Southern District chinook harvest usually consists of incidental catches of adult fish returning to three separate enhancement projects. The 1999 Southern District harvest of 1,760 chinooks was the fifth highest in the last 20 years (Appendix Table 12). Only about 15% of the chinook catch was taken by seiners, with set gillnetters taking the remainder. The district-wide coho salmon harvest of 2,800 fish was less than 60% of the recent 10-year average (Appendix Table 17) and was split equally between set gillnetters and seiners (Table 1).

Kamishak Bay District

Sockeye Salmon

The entire Kamishak Bay District, with the exception of the Chenik and Paint River Subdistricts, opened to salmon seining by regulation on June 1. In a departure from the established norm from previous years, the weekly fishing schedule was set at seven days per week. The complexion of the fishery had changed significantly since 1994 when fish processors ended the routine practice of stationing a tender or tenders in this remote district at the start of each season. As a result, effort and resultant catches declined as fishermen were forced to devise their own transport of all salmon harvested. Recognizing this shift in effort levels, as well as the harsh weather that typically limits effective fishing activity, the staff determined that opening

waters of Kamishak Bay District to commercial seine fishing seven days per week would allow opportunity to harvest salmon without unduly jeopardizing spawning escapement requirements.

The earliest natural sockeye salmon return to the management area, at Mikfik Creek in the McNeil River Subdistrict, began slowly as no fish were spotted during the first aerial survey on June 2. By June 11, the approximate date of the traditional peak, the number had only increased to 700 sockeyes, suggesting that the run was extremely weak. Six days later a survey revealed about 3,000 fish in fresh water, shy of the escapement range of 5-7,000 fish and still suggestive of a weak return. However, over the next five days, a significant influx of new fish occurred, with a survey estimate of nearly 20,000 sockeyes on June 22. Of the total, over 5,000 fish were observed in the lake and in the lagoon at the outlet of the lake. Since this figure fell within the escapement goal range, the staff concluded that a seine opening in waters of McNeil Lagoon would allow opportunity to harvest fish surplus to spawning escapement requirements. A special two-hour opening was announced by emergency order for June 24. The opening, which adhered to the guidelines set forth in the *Mikfik Creek/McNeil Lagoon Salmon Fishery Management Plan* approved by the ADF&G commissioner in 1988, resulted in the harvest of about 6,000 sockeyes. The effort was a cooperative one involving four seiners. Very little additional effort on this return occurred, with the season harvest totaling 7,200 sockeyes in McNeil River Subdistrict (Table 3). The peak aerial survey, conducted just prior to the special lagoon opening, totaled approximately 21,500 sockeyes. After accounting for that day's catch, the final escapement index was 15,700 sockeyes (Table 3, Appendix Table 23). The late timing of this season's return was highly unusual as it was nearly two weeks later than the normal peak for the system.

After the Mikfik sockeye return, seiners would next normally turn their attention to the Chenik or Douglas River Subdistricts during the final days of June. Once again, however, no fishing would occur at Chenik Lake this year due to the lingering effects of the IHNV outbreak in previous years and the subsequent decrease in adult returns. Despite the forecasted weak return, the staff was hopeful that the run would at least approach the escapement goal of 10,000 sockeyes. Unfortunately, a sixth consecutive year of dismal returns was manifested,

and even with no fishing effort during the entire season, the total escapement at Chenik Lake was estimated by aerial surveys at only 2,850 sockeyes (Table 3, Appendix Table 23). No effort occurred in the Douglas River/Silver Beach Subdistrict, as seiners appeared to be waiting for more lucrative fishing elsewhere in the district.

The next sockeye return in the Kamishak Bay Subdistrict was to nearby Kirschner and Bruin Lakes in the Bruin Bay Subdistrict. Both lakes have been traditional sites of sockeye salmon lake stocking projects. At Kirschner Lake, where a steep falls at tideline precludes escapement into the lake, 30,000 sockeyes were predicted to return, with an additional 1,000 fish expected at nearby Bruin Lake. As outlined in the Trail Lakes Hatchery Annual Management Plan (AMP) prior to the season, the revenue goal necessary to meet operational expenses incurred in LCI sockeye salmon lake stocking projects was set at \$130,000. This amount was to be split between the Southern District SHA's (Leisure/Hazel) at 60% of the total and the Kamishak SHA's (Kirschner/Bruin) at 40%. No cost recovery was planned at Chenik Lake in 1999 since weak returns were once again expected. Projected harvests of 16,000 sockeyes from the Kirschner and Bruin Lakes SHA's were necessary to achieve the revenue goal of \$51,200, assuming an average price of \$0.80 per pound and an average weight of 4.0 pounds per fish.

Preseason management strategy for the Bruin Bay Subdistrict, as outlined in the Trail Lakes Hatchery AMP, was to open the Kirschner and Bruin SHA's (Figure 6) to hatchery cost recovery fishing on a continuous basis beginning June 21 while keeping both closed to common property seining. This would allow opportunity for CIAA to achieve the sales harvest goal quickly at the beginning of the run. As soon as the goal was met, the two SHA's were to be closed to cost recovery harvest and opened to commercial seining so the fleet could work the areas uninhibited for the remainder of the season.

CIAA had made arrangements prior to the season for a CISA vessel to conduct cost recovery. The first effort occurred in the Kirschner Lake Section on July 14, resulting in an estimated harvest of 4,000 fish. Unfortunately, the inseason price for Kirschner cost recovery sockeyes

dropped to \$0.68 per pound due to freshwater marking, which in turn reduced the total value of the first harvest to about 22% of the revenue goal. The second effort occurred over two weeks later on July 31, netting the remainder of the goal. In response, waters of both SHA's were closed to hatchery cost recovery fishing effective August 2. Because sockeye salmon returning to the Kirschner Lake stocking site are prevented from entering the lake by a steep waterfall at tideline, no escapement is possible and a total harvest is desired. In an effort to provide maximum opportunity to achieve a 100% harvest, waters of Bruin Bay Subdistrict were therefore opened to commercial salmon seining seven days per week effective August 2.

A total of three boats fished the area opened to continuous fishing, focusing their efforts on the Kirschner Lake sockeye return. Just over 22,000 sockeyes were landed for the season (Table 3) with the last landing made on August 6. An aerial survey in mid-August documented about 800 sockeyes holding in saltwater near the waterfall at Kirschner Lake. Including these unharvested fish, the total return to Kirschner Lake was estimated at about 40,500 sockeyes, exceeding the preseason prediction for the system. Only 10 fish were estimated via aerial surveys in Bruin Lake Creek, also prevented by a barrier falls from reaching suitable spawning habitat. Similar to the Mikfik sockeye return, the Kirschner/Bruin return was considered to be slightly later in run timing than its historical average.

Pink Salmon

Preseason pink salmon projections for the Kamishak Bay District were fairly optimistic, with significant harvestable surpluses forecasted for both Bruin Bay and Ursus Cove Subdistricts. In striking contrast to the forecast, actual pink returns to Kamishak Bay systems were paltry. Aerial surveys bore out this fact as the three major rivers (Bruin River, Sunday Creek, and Brown's Peak Creek) barely experienced any pink salmon escapement at all. The meager returns resulted in zero effort specifically targeting pinks during 1999. The total harvest for the season amounted to only 800 fish (Table 5, Appendix Table 18), all incidentally taken during the sockeye harvests at Kirschner Lake. None of the monitored systems in Kamishak Bay attained their escapement goals (Appendix Table 24).

Chum Salmon

Cumulative chum salmon catches for the entire Kamishak Bay District totaled only 23 fish, the third lowest harvest on record (Appendix Table 21), once again reflecting the lack of interest brought about by generally low prices paid for this species. A conservative management strategy designed to protect returning chums was hardly necessary since the combination of low prices and lack of tender service discouraged the fleet from targeting this species in any portion of the district. Thus entire runs were allowed to enter their natal streams with little or no accompanying fishing mortality. The 1999 chum harvest occurred incidentally during the sockeye fishery.

Because McNeil River chum runs had failed to achieve the lower end of the desired escapement range for most of this past decade, the staff intended to utilize a conservative strategy by closing the subdistrict should significant effort appear imminent. However, no effort occurred, as the run never materialized in sufficient strength to attract any seiners. Nonetheless, with escapement lagging at the end of July, the subdistrict was closed to fishing by emergency order on August 2 to protect the remainder of the return.

The first chum salmon of the season were observed at McNeil River during a survey conducted on June 28, but numbers were low with less than 100 fish observed in fresh water. By July 2 the index estimate had increased to only 1,300 chums in fresh water, reinforcing the assessment that the McNeil chum return appeared weak. Weather and turbid water conditions precluded surveys for about 10 days, and the next survey on July 12 revealed an estimated 5,100 chums. Another (11 day) lag in surveys occurred, but during the ensuing aerial survey on July 23, no significant increase in escapement was documented. Surveys continued into mid-August, with the peak individual estimate occurring on the season's last survey on August 17, totaling 5,300 chums. Analysis of aerial survey data using the standard area under the curve (AUC) method yielded a final estimated escapement index at McNeil River of only 13,500 chums (Appendix Table 25). This marked the lowest index of escapement to McNeil

River since 1991 and was a disappointment after two consecutive years in which the river's escapement goal of 20,000 to 40,000 chums had been met.

Aerial surveys elsewhere in the Kamishak Bay District were in somewhat stark contrast to McNeil River, generally indicating that other chum returns to more northerly Kamishak Bay systems were fairly good. Chum escapements into Iniskin River, Ursus Cove, Cottonwood Bay, and Bruin Bay systems appeared fair to good, but the recurring theme of low prices and market demand again kept the fleet away. Therefore, these chum runs were unaffected by fishing mortality and entered their natal streams as escapement. All three major northern Kamishak Bay systems (Iniskin, Cottonwood, Ursus) achieved their established escapement goals (Appendix Table 25), while Bruin River also met its goal. In southern Kamishak Bay, limited aerial survey information for the Big and Little Kamishak River systems suggested that those systems failed to meet their escapement goals (Appendix Table 25).

Other Species

Chinook salmon harvests in the Kamishak Bay District historically have been insignificant (Appendix Table 12). On the other hand, coho harvests within the district have at times been substantial, providing fishermen with some lucrative late season catches. Coho assessment in LCI is very limited, but early indications from other areas within LCI suggested only fair returns. The small returns, lack of tender service, and low prices conspired to preclude any effort or harvest (Appendix Table 17) for the third consecutive season in this district.

Outer District

Sockeye Salmon

Outer District sockeye harvests historically have focused on natural returns to the Delight and Desire Lakes systems in East Nuka Bay Subdistrict. A lake stocking project in the Port Dick area during the late 1980's provided additional fish for harvest in the early 1990's, but

stocking was discontinued after 1989 and a small harvest in 1993 was the last documented catch. Preseason projections forecasted a harvest of up to 22,300 sockeyes for the entire Outer District. The actual harvest totaled 51,100 fish (Table 3), over five times greater than the recent 10-year average (Appendix Table 13).

Aerial surveys, the traditional method of assessing adult sockeye returns to Delight and Desire Lakes in East Nuka Bay, were supplemented by a counting weir at Delight Lake once again in 1999. The weir, in the third year of operation, was a continuation of a salmon smolt enumeration project begun in May. Theoretically the weir would provide a more precise assessment of the adult returns than aerial surveys, which are frequently plagued by poor viewing conditions induced by inclement weather. The weir counts would be especially important for management during any extended periods when aerial surveys could not be conducted. In addition, for the second consecutive season at Delight Lake, a remote video escapement recorder (RVER), consisting of a digital video camera connected to a time lapse video cassette recorder (VCR), was utilized as part of a pilot adult salmon assessment project. The goal of the project is to determine the feasibility of deploying such a system at remote sites where other forms of assessment are problematic due to weather or are prohibitively expensive.

Aerial surveys began on June 18, documenting sockeyes in freshwater at both systems, but numbers were relatively small. The next survey on June 23, conducted under good conditions, showed no appreciable increase in escapement. Five days later, however, a survey showed a dramatic increase at Desire Lake, where about 6,700 sockeyes were estimated in fresh water, while numbers at Delight Lake showed a much smaller increase over the prior surveys. This was not unusual as run timing for sockeyes at Delight Lake is normally later than that of Desire Lake. Since the figure for Desire Lake represented about 70% of the system's established escapement goal of 10,000 fish, waters of East Nuka Subdistrict between the entrance to James Lagoon and the regulatory markers north of Desire Lake were opened to commercial seining five days per week beginning June 29. Waters near Delight Lake were kept closed to fishing while monitoring of that system's return continued.

Commercial seine catches near Desire Lake suggested the run was steadily building. Poor weather conditions hampered aerial surveys over the next two weeks, and as a result no appreciable increases in fresh water escapement at Desire Lake were detected. But by July 12, weir counts at Delight Lake, coupled with aerial estimates, indicated that the fresh water escapement goal of 10,000 sockeyes into that system had been met. As a result, all waters of East Nuka Subdistrict, including those of McCarty Lagoon, were opened to seining five days per week beginning July 14. Concurrently, the closed waters markers protecting the mouths of both Delight and Desire Lakes were rescinded, and fishing was allowed up to both creek mouths.

Weather conditions continued to hamper aerial surveys for the remainder of the season, but a peak daily count of nearly 15,000 sockeyes at Desire Lake, which occurred on July 28, was also used as the final escapement estimate (Table 3, Appendix Table 23). Meanwhile, daily weir counts at Delight Lake showed a number of spikes: July 3-4, July 10-11, and July 21-23. By July 25, over 13,400 sockeyes had been counted through the weir, easily surpassing the 10,000 fish escapement goal. However, water levels, which had been steadily dropping since mid-July, finally reached a stage that effectively precluded fish passage into the lake. Sockeyes continued to build in the fresh water lagoon located near salt water, but upstream migration halted. The weir was taken down and the crew removed on July 25 as planned, but the low water levels persisted over the next week, preventing upstream fish migration. When the weather finally changed, heavy rains that quickly brought water levels up to near-flood stage hit the area.

The low water levels and subsequent cessation of upstream salmon migration observed at Delight Lake this season were not a new or uncommon phenomenon. The system characteristically exhibits these effects following extended periods of warm weather and limited precipitation during mid to late summer periods. One side effect of this occurrence during 1999, not normally seen in most years, was the apparent elevated mortality of sockeye adults in the lagoon near salt water. During an aerial survey on August 9, an estimated 2-300 carcasses were observed on the bottom of the lagoon. Although no samples were collected to positively identify these fish for cause of death, it was hypothesized that warm water temperatures and low oxygen levels in the lagoon, caused by the exceptionally nice weather and extremely low water flow, created severe

stress on the fish as they waited for an improvement in water conditions that would allow them to migrate upstream into the lake.

Over the next month, the Delight Lake system was monitored primarily with the remote video camera. Unfortunately and coincidentally, the camera experienced minor technical problems that precluded a complete time series assessment. As a result, the sockeye escapement into Delight Lake was monitored only intermittently between August 2 and August 26, at which time the weir was erected again. Although video tapes documenting escapement during this period are available, they have not yet been analyzed for counts. Escapement during this time, combined with weir counts from the latter stages of the return in late August and early September, was estimated at 3,000 sockeyes entering Delight Lake after July 25, bringing the cumulative escapement total to approximately 17,000 fish (Table 3, Appendix Table 23).

The first seine landing of sockeyes in East Nuka Subdistrict came on June 30 when 1,000 sockeyes were taken, considered quite reasonable for that date. Although effort was modest, catches averaged nearly 1,000 sockeyes per landing over the first two weeks of July, during which time only those waters around Desire Lake were open to fishing. After escapements appeared to be progressing steadily towards the established goals for Desire and Delight Lakes, the area open to fishing was expanded to include all waters of East Nuka Subdistrict, including McCarty Lagoon, beginning July 16. Catches jumped to an average of about 4,500 sockeyes per day fished for the second half of July, while escapements continued to build at an adequate rate. The modest effort continued through August, with numbers of pink salmon bound for Desire Lake Creek increasingly appearing as incidental catches during the early part of the month and coho salmon bound for both systems showing up later in the month. The final sockeye landing occurred on August 31, bringing the cumulative commercial catch to 51,100 fish in East Nuka Subdistrict (Table 3, Appendix Table 14).

A third system of lakes known as Delusion (or Ecstasy or Delectable) Lakes in East Nuka Subdistrict has been monitored over the last decade to document the sockeye return there. Located near the head of the East Arm of Nuka Bay, the two-lake system is relatively new,

formed during the late 1970's and early 1980's by a receding glacier. Reviewing charts and maps drawn prior to the mid-1980's substantiated this fact as no lakes are indicated at the site of the present bodies of water. Prior to the 1980's, no salmon were known to utilize the system, but in approximately 1989, during a routine aerial survey, adult sockeye salmon were documented in the system by the staff for the first time. Each year since then, aerial surveys have revealed sockeye salmon as well as pink salmon in the system. The peak 1999 aerial count of 1,140 sockeyes was recorded during an aerial survey on July 28. Little is known of the origins of this return, although the predominant hypothesis suggests that sockeyes probably strayed from nearby Desire and/or Delight Lake to colonize this new lake system. Sampling of sockeyes in this system was conducted in 1992, 1993, and 1994 by ADF&G personnel, with help from University of Alaska students on site. Otoliths and length measurements indicated primarily large 3-ocean fish (six years old). Additional tissue samples were taken from post-spawning individuals in 1993 and 1994 for inclusion into the genetic baseline data set and future genetic stock identification analysis.

Pink Salmon

Harvest forecasts for pink salmon in the Outer District were fairly optimistic for an odd year at 382,000 fish, over three times the recent 10-year average, with the greatest potential for harvestable surpluses expected at Port Dick, Windy Bay, and Nuka Island. The actual harvest of 32,500 pinks (Table 5, Appendix Table 18) was the lowest odd-year catch for the district since 1987 and the second lowest odd-year catch in the last 20 years. Due to surprisingly weak pink returns throughout the Outer District, no areas were opened to directed effort at pinks. As a result, the only harvest that occurred was incidental during the directed sockeye fishery in East Nuka Subdistrict.

For the second consecutive season, a management strategy based on real-time assessment of returns and escapements was utilized for pink salmon throughout the Outer District. Aerial surveys in Port Dick began in mid-July, but no pinks were observed. Pinks first appeared in Port Dick (head end) Creek at the end of July, as a ground survey on July 27 detected a handful of

fish. Aerial surveys that week and the first week of August failed to detect any significant buildup of pinks in salt water, suggesting that the return was much weaker than predicted. The next ground survey on August 10 substantiated this theory by documenting only 1,100 fish in fresh water. With a minimum desired escapement goal of 20,000 pinks, the aerial and ground estimates provided no justification to allow fishing, so the subdistrict remained closed.

Pink numbers on the shallow salt water “flats” at the head end of Port Dick never achieved levels suggested by the preseason forecast. The peak daily in-stream ground count amounted to less than 6,000 pinks, a paltry figure considering the 37,000 fish estimate of escapement during the 1997 parent year. The final escapement estimate, based on the area under the curve (AUC) calculation, was 8,300 pinks (Table 5, Appendix Table 24), falling far short of the desired minimum and representing the third lowest odd-year escapement over the last 20 years.

Pink salmon escapement at nearby Island Creek in Port Dick also lagged. The first observation of pinks was made there during a ground survey on August 16, but with a count of less than 100 fish the run appeared to be mirroring that of Port Dick (head end) Creek. The next ground survey two weeks later documented a disappointing 2,300 fish, while aerial surveys failed to detect significant numbers in salt water all season. The final estimate of escapement for Island Creek was 8,600 pinks (Table 5, Appendix Table 24), failing to achieve the minimum desired goal of 12,000 fish and lowest amount for the system since 1989.

Aerial surveys for pink salmon at Nuka Island began in early July, but fish were not documented until July 28, considered very late by historical standards. Numbers were meager, however, as the theme of poor pink returns to the Outer District was becoming undeniably obvious. Aerial surveys continued to assess the return, but numbers were so abysmally low that sending the ground survey crew to South Nuka Island could not be fiscally justified throughout the entire season. The final estimate of escapement, based entirely on aerial surveys, was 2,400 pinks (Table 5, Appendix Table 24), less than one-quarter of the desired goal of 10,000 fish and the second lowest total of the 1990's.

Only two systems in the Outer District, both on the southwestern tip of the Kenai Peninsula, experienced fair pink salmon returns. At Port Chatham, surveys indicated an estimated cumulative escapement of 10,700 pinks into systems there (Table 5, Appendix Table 24), slightly exceeding the minimum desired goal. Systems at nearby Koyuktolik (Dogfish) Bay, traditionally known as chum salmon producers, ended the season with a cumulative escapement estimate of over 12,000 pinks, the third consecutive odd-numbered year of good returns.

Elsewhere in the Outer District, other monitored systems reflected the overriding trend of weak returns, with most failing to meet their pink salmon escapement goals by significant margins. These include Rocky River (17,200), Windy Left (24,000), Windy Right (5,200), and Desire Lake Creek (6,800; Table 5, Appendix Table 24). As stated previously, due to the weak nature of the returns, no areas were opened to commercial effort directed at pink salmon in the Outer District, and resultant harvests came solely as incidental catch during the sockeye fishery in East Nuka Subdistrict.

Chum Salmon

Chum salmon numbers have experienced dramatic declines in the Outer District since the peak harvest years of the late 1970's and early 1980's. Large returns were once again not expected in 1999 due to a succession of poor returns over the past several seasons. No specific commercial openings targeting chum salmon occurred this season, with a final harvest of 2,100 incidentally caught fish (Table 6, Appendix Table 21).

Escapements into two of the three monitored chum salmon systems in the Outer District were weak, with only one of the three achieving its goal. Port Dick (head end) Creek fell short of its 4,000 chum escapement goal by 1,100 fish, while Rocky River escapement amounted to only 700 chum salmon, far short of the goal of 20,000 (Appendix Table 25). Island Creek was the only bright spot in the Outer District, where chum escapement totaled 16,400 fish, slightly greater than the upper end of the escapement goal range of 10,000 to 15,000 fish.

Eastern District

Sockeye Salmon

The Eastern District had potential for harvestable surpluses of sockeye salmon in Aialik and Resurrection Bay Subdistricts during 1999, with a district-wide preseason projection of over 170,000 fish. Actual harvest totaled about 135,000 sockeyes (Table 3, Appendix Tables 13 and 14), setting a new all-time record for the district. However, over 80% of the total was taken as hatchery cost recovery at the Bear and Grouse Lakes weirs (Table 1) in the Resurrection Bay Subdistrict.

At Bear Lake, near Seward in the Resurrection Bay Subdistrict, sockeye enhancement activities by CLAA resulted in a projected return ranging as high as 39,000 fish assuming optimum survival of various smolt and fry releases. Based upon the expected long-term increase of sockeyes returning to this system, a Resurrection Bay Management Strategy was developed during the winter of 1991-92. The plan allows the seine fleet to begin fishing on the Bear Lake sockeye run at a relatively early date in the outer reaches of Resurrection Bay in order to promote product quality. In addition, several modifications to the plan, first implemented by emergency order in 1996, have been utilized each ensuing season. The first change increased fishing time from two 40-hour periods per week to a single five-day period (Monday through Friday). Based on experience over the past three seasons, this increase would allow greater opportunity to harvest sockeyes without jeopardizing the escapement goal for Bear Lake, set at 5,000 to 8,000 fish in the Trail Lakes Hatchery Annual Management Plan. The second change posted closed waters markers at the mouth of the Resurrection River to better define the river's mouth and the fishing boundaries, which had been problematic prior to 1996. Finally, an area of closed waters along the west side of Resurrection Bay between Caines Head and the city of Seward was implemented in order to protect returning chinook salmon, which are allocated entirely to the sport fleet and are illegal to retain in the commercial fishery.

The entire Resurrection Bay Subdistrict, up to a point one mile due south of Cape Resurrection and Aialik Cape, was opened to seining by emergency order beginning on May 17, the third Monday of May. Prior to 1998, these waters were opened on the second Monday in May, but experience had demonstrated that sockeyes did not begin arriving in Resurrection Bay in appreciable numbers until the end of the month. Despite presumption of an early run timing for this enhanced run (since brood stock utilized for the project had a documented run timing peaking in early June), the first three years of adult returns from 1992 through 1994 actually trickled in over the course of two months. Between 1995 and 1998, with larger numbers of fish returning, the majority of the run appeared in waters at the head of Resurrection Bay during the first two weeks of June. When the area first opened in 1999, fishermen were generally not eager to wet their nets, realizing that significant numbers of fish were unlikely to appear on the grounds until the end of the month. The first landing occurred nine days after the opening, but fish concentrations were expectedly meager. By the end of that first week of actual fishing, about 1,400 fish had been landed, suggesting that the preseason forecast might be relatively accurate. Effort remained low during the first week of June despite modestly increasing catches. The escalating catches attracted a few more boats, and as a result harvest and effort peaked during the second week of June, when eight vessels landed 5,800 sockeyes. Catch and effort dropped steadily through the remainder of the month, with the final landing coming on July 2. The cumulative seine harvest totaled 22,600 sockeyes in Resurrection Bay (Table 3).

Escapement rates at CIAA's Bear Creek weir began to steadily increase over the first two weeks of June, as would be expected by the seine fishery's performance. Cost recovery efforts were initiated on June 14, but numbers of fish inexplicably dropped off for three days from June 18-20. From that time until the first week of July, the weir experienced relatively steady numbers of fish, after which time the rate decreased steadily. However, the return continued to trickle in until late August. The escapement goal of 8,000 sockeyes into Bear Lake was nearly met (Appendix Table 23), with an additional hatchery cost recovery harvest of approximately 9,100 sockeyes. The cumulative Bear Lake sockeye return totaled approximately 39,000 fish, which proved to be shy of the forecasted level of 47,000.

A second, more recent sockeye enhancement project was initiated at nearby Grouse Lake in 1996, when over 200,000 juvenile fish were planted in the system. Grouse Lake has been stocked each year since (except for 1999), but adult returns have failed to meet expectations for unknown reasons. As outlined in the Trail Lakes Basic and Annual Management Plans, the entire sockeye return to Grouse Lake is allocated specifically to CIAA for the purpose of hatchery cost recovery.

With an expected run timing later than Bear Lake fish, Grouse Lake sockeye adults first began to show up at the fresh water weir around mid-July in 1999, but numbers were small. By the end of July the run (and cost recovery harvests) had built to levels suggested by the preseason projection. Numbers remained steady (around 5,000 fish per day) over the next week, peaking on August 6 when over 11,000 sockeyes were harvested for cost recovery. Catches slowly declined after that, but fish continued to trickle in until mid-September, with the final harvest taking place on September 11. The final estimated cumulative return to Grouse Lake totaled about 104,000 sockeyes. Unfortunately, the traditional characteristic of poor product quality exhibited by fish returning to this enhanced system continued this season, with approximately half of the entire return donated to dog mushers or discarded completely because of a lack of buyers. Although the run fell short of the preseason forecast, it was still the highest on record for the enhancement project at this site, providing optimism for future returns.

At Aialik Lake in the Aialik Subdistrict, the first aerial survey of the season on June 18 produced an estimate of 50 sockeye present in fresh water, while the next survey 10 days later revealed less than 100 fish in the system. With such low numbers, no commercial effort was justified and the area remained closed to seining. By July 12, the escapement estimate had increased to 1,100 sockeyes, still short of the minimum desired goal of 2,500 fish. Finally on July 16, a survey showed an estimated 2,900 sockeyes in fresh water at Aialik Lake, falling within the desired range of 2,500 to 5,000 fish. As a result, waters of Aialik Subdistrict, including Aialik Lagoon, were opened to seining five days per week beginning July 19. By this time, however, the return had already peaked and little effort actually occurred. Total harvest for the season amounted to

less than 100 sockeyes (Table 3 Appendix Table 14). Final escapement into Aialik Lake was estimated at 3,900 fish (Table 3, Appendix Table 23).

Pink Salmon

A harvestable surplus of over 16,000 pinks was forecasted in Eastern District waters for 1999, but this projection was questionable due to weak returns in some recent years. Although surveys of Resurrection Bay systems were limited to on-grounds estimates in mid-August, results and final estimates suggested that returns were highly variable, depending on individual systems. At Bear and Salmon Creeks, where the combined pink escapement goal is 15,000 fish, a total of 7,800 pinks was estimated (Appendix Table 24). The figure for Thumb Cove, with a goal of 4,000, was estimated at just over 9,000 pinks, while at Humpy Cove (2,000 fish escapement goal) 4,000 fish were estimated. Tonsina Creek produced an estimate of only 500 pinks, continuing a trend of poor returns to that system over most of the last decade. Due to the variability of returns and the limited assessment, no openings for pinks were allowed in Resurrection Bay and therefore no harvest occurred.

Aialik Subdistrict, originally opened to fishing five days per week on July 19 for sockeye salmon, was never closed after the sockeye run was effectively over. During some recent years, the subdistrict was allowed to remain open despite knowledge that seiners were fishing the outer areas later in the season, targeting pink salmon bound primarily for Prince William Sound. The staff elected to leave the area open again in 1999 because the relatively modest historical catches would not likely threaten either local or non-local stocks. Very little effort resulted, however, with the season's pink harvest totaling approximately 900 pinks in Aialik Subdistrict (Table 5).

Other Species

Chum salmon are the only other commercially important species in the Eastern District, but catches during the four years prior to 1999 were dismal. This season's chum harvest amounted to 1,200 fish (Table 6, Appendix Table 21), with all fish taken incidentally in Aialik Bay during

other directed effort there. An estimated 2,500 chum salmon were estimated as escapement into Tonsina Creek in Resurrection Bay (Table 6).

Coho salmon are not normally a commercially important species in the Eastern District but are an integral component of an enhancement project, originating from Bear Lake, which benefits sport fishermen in area waters. All coho salmon entered into the Seward Silver Salmon Derby are subsequently sold by the city of Seward, organizer of this sport fishing derby, to a commercial processor. Therefore, these catches are considered "commercial harvests" and are listed in the commercial catch tables to document this fact. In 1999, a total of nearly 1,300 cohos were entered into the Seward Silver Salmon Derby (Table 4), down considerably from previous years. In addition, a portion of the returning adults from this project are harvested at the Bear Creek weir by CIAA as cost recovery for expenses incurred. Although CIAA normally sells most of these fish to a commercial processor(s), many of the fish were unmarketable due to excessive fresh water marking and were subsequently donated to various individuals, many of whom were dog mushers. Total hatchery harvest from the Bear Creek weir (including brood stock and mortalities) was 3,400 cohos (Tables 1 and 4), comprising nearly half of the entire LCI coho catch this season. An additional 400 fish were allowed into Bear Lake as escapement (Table 4). Total commercial catch in the entire Eastern District amounted to about 3,800 cohos (Table 4, Appendix Table 17), the lowest district-wide total since 1992.

SALMON ENHANCEMENT AND REHABILITATION

Introduction

Fisheries enhancement has played a major role in LCI salmon production for two decades. Natural adult salmon returns to the LCI area continue to demonstrate wide fluctuations, often the result of environmental impacts such as streambed scour, de-watering, or redd freeze-out on spawning grounds. Since their inception in the mid-1970's, enhancement and rehabilitation projects have made significant contributions to both commercial and sport fishing harvests.

These contributions have historically ranged from 24% to 90% of the entire LCI commercial salmon harvest and are expected to remain high in future years.

Projects initiated by the ADF&G and presently being undertaken by CIAA and/or CRRC provided an estimated 91% (1.48 million salmon) of the total 1999 LCI commercial harvest of 1.635 million fish. The Leisure/Hazel, Kirschner, Bear, and Grouse Lakes sockeye salmon enhancement projects produced 84% (401,500 fish) of the total LCI sockeye harvest of 476,800 fish in 1999, helping to establish a new record harvest for the species. Tutka Lagoon Hatchery production accounted for 95% (1.08 million fish) of the 1999 LCI commercial pink salmon harvest of 1.14 million fish.

Using average weights per fish and average prices per pound in LCI, the estimated contribution of ADF&G/CIAA/CRRC-produced salmon was 90% (\$2.72 million) of the \$3.02 million total value of the 1999 LCI commercial salmon harvest. About 25% (\$0.73 million) of the total exvessel value of the fishery was utilized for hatchery cost recovery purposes (Table 7). A brief description of the current enhancement projects in LCI follows.

Tutka Lagoon Hatchery

The Tutka Lagoon Salmon Hatchery/Rearing Facility was constructed in 1976 with an initial production capacity of 10 million salmon eggs, but expansion over time, including major renovation work during the winter of 1993-94, has increased its capacity to the present level of approximately 150 million eggs. Pink salmon have been the primary species produced at the hatchery, while secondary chum enhancement was discontinued in favor of recent efforts directed toward sockeye salmon. Although the hatchery now has a sockeye egg capacity of 1.8 million eggs, and raceways to accommodate the resulting fry, efforts to incubate and rear sockeye smolts have been plagued by the IHN virus, resulting in an indefinite suspension of the sockeye program.

In 1999 the adult pink salmon produced by Tutka Lagoon Hatchery totaled approximately 1.26 million fish (Table 9). No attempt was made to identify the contribution resulting from natural spawning in Tutka Creek. The estimated 1.4% overall survival rate this season was below average for combined fry releases/adult returns to this facility during the 1990's. The commercial harvest, including cost recovery, of 1.08 million pink salmon from Tutka Bay and Lagoon (Table 9), accounted for approximately 98% of the pink salmon landed in the Southern District and 95% of the entire LCI commercial pink salmon harvest. Pinks taken for hatchery cost recovery purposes from the Tutka Bay Subdistrict totaled 857,900 fish, worth approximately \$375,000 and, when combined with pinks taken incidentally elsewhere during sockeye cost recovery operations, essentially achieved CLAA's pink salmon revenue goal in 1999. Approximately 60.1 million short-term reared pink salmon fry were released into Tutka Bay in 1999 (Appendix Table 31), the lowest total since 1993 due to unforeseen mortalities.

Leisure and Hazel Lakes Sockeye Salmon Stocking

Leisure Lake, also called China Poot Lake, historically was a system barren of sockeye salmon. A study initiated in 1976 involved the stocking of hatchery-produced sockeye salmon fry to determine optimum stocking levels prior to and after lake enrichment through fertilization. Because a barrier falls below the lake prevents upstream migration and precludes any adult spawning, it is desirable to harvest all returning adult fish in the terminal harvest area, China Poot Bay. Beginning in 1988, a similar sockeye stocking program was initiated at Hazel Lake, which empties into Neptune Bay and is located approximately three miles south of Leisure Lake. Since the inception of these projects, nearly 1.9 million adult sockeyes were estimated to have returned as a result of these stocking programs (Appendix Table 15), making significant contributions to the commercial and recreational sockeye harvests in the Southern District.

Because of the close proximity of the two terminal harvest areas, and the absence of a mark/recovery program, adult returns to Leisure and Hazel Lakes cannot be separately identified through sampling within the commercial catches and are therefore presented as a combined total. The cumulative total sockeye return to Leisure and Hazel Lakes in 1999 was estimated to be

226,000 fish (Figure 11, Appendix Table 15), over two and one-half times the 1979-98 average and nearly double the recent 10-year average (it should be noted that these figures reflect returns to Leisure Lake only prior to 1991). The cumulative commercial harvest of 219,300 fish comprised 90% of the Southern District sockeye harvest and about 46% of the total LCI sockeye salmon harvest.

Due to severe winter conditions, an outbreak of IHNV at Trail Lakes Hatchery, and other rearing and incubation problems, only 265,000 sockeye salmon fry were released into Leisure Lake in 1999 (Appendix Table 31), breaking the trend of high-density stocking utilized during the past several seasons. At Hazel Lake, 453,000 sockeye fry were stocked in 1999, also a reduction from previous years due to the aforementioned hatchery difficulties.

English Bay Sockeye Salmon Rehabilitation

The English Bay Lake system has the only significant stock of sockeye salmon native to the Southern District of LCI. Unfortunately, the English Bay sockeye returns declined to their lowest recorded levels in the last half of the 1980's decade. Sockeye escapement estimates between 1985 and 1993 ranged from 2,500 to 8,900 fish; all but one of these years (1993) was well below the 20-year average of 7,800 fish (Appendix Table 23). The decline of the English Bay sockeye run resulted in a very restrictive management strategy for this area. The commercial, sport, and subsistence fisheries were closed during the sockeye run for most years mentioned. Efforts to rehabilitate this depressed stock were initiated by ADF&G with an egg take in 1989 and the subsequent release of 350,000 sockeye salmon fry in 1990 (Appendix Table 31). Chugach Regional Resources Commission (CRRC), in cooperation with the village of Nanwalek (formerly English Bay) and the Bureau of Indian Affairs (BLA), has since taken over this enhancement project and continued egg collections, fry rearing, fry stocking, and operation of a smolt/adult enumeration weir.

Whereas the escapement figures for English Bay Lakes prior to 1994 were index estimates based on aerial surveys, escapements beginning with the 1994 season have been monitored

through the use of a counting weir, operated by CRRC. The cumulative total that first year numbered 13,800 sockeyes (Appendix Table 23), the highest return since 1982 and the first year since 1984 in which the minimum desired goal of 10,000 fish was achieved. In 1995 and 1996, the weir totals were 22,500 and 12,400, respectively, with the former representing the highest figure over the past 20 years.

Optimum escapement for this system recently has been estimated to be less than the published maximum goal of 20,000 sockeyes (Edmundson et al. 1992). A plan to tightly control spawning escapement into the lake by harvesting those fish surplus to the maximum desired goal of 15,000 was adopted by ADF&G staff, representatives of CRRC, and village residents from Nanwalek during meetings held over the winter of 1995-96.

Unfortunately, due to high juvenile mortalities several years ago, the preseason forecast for adults returning to English Bay Lakes totaled only about 20,000 fish in 1999. As a result, the commercial fishery in Port Graham Subdistrict was not allowed to open in order to provide maximum protection to the returning sockeyes. The fish in excess of escapement requirements would be available to meet the subsistence needs of villagers in Nanwalek and Port Graham. The return seemed to track well with the preseason projection based on early weir counts and subsistence catches, so no restrictions were imposed on the subsistence fishery. Although the return peaked during the first few days of July, it continued through the rest of the month. By July 19, the cumulative count past the weir had achieved the optimum escapement goal of 15,000 fish. As a result, the English Bay Special Harvest Area (SHA) was opened to cost recovery fishing for Port Graham Hatchery Corporation (PGHC) seven days per week beginning July 19. However, since the run was past its peak only minimal effort occurred with a resultant harvest of less than 700 sockeyes (Table 3). The enumeration weir was dismantled on July 22, with a final escapement count totaling 15,844 sockeyes, slightly exceeding the desired goal. Since subsistence set gillnet harvests in the Port Graham Subdistrict were presumably comprised of a high percentage of English Bay sockeyes, the total return was estimated to approach 20,000 with the addition of these fish.

Approximately 918,000 long-term reared sockeye fry were released into English Bay Lakes in November, 1999, while an additional 231,000 fry were being held over winter for release in the spring of 2000. An estimated 1.37 million sockeye eggs were collected from brood stock taken in English Bay Lakes during 1999. These eggs were incubated during the winter of 1999-2000 in the former coho salmon module at the Port Graham Hatchery, used because construction of the new sockeye modules was only recently completed.

Bear Lake Sockeye Salmon Enhancement

Bear Lake, located at the head of Resurrection Bay in the Eastern District, has been the target of sockeye salmon enhancement efforts over recent years. Since 1962, this system has also been the centerpiece of a Sport Fish Division coho salmon enhancement program, part of which included limiting the escapement of sockeye salmon into the lake. As a result, only a small remnant run of naturally spawning sockeye salmon remained at Bear Lake. In an effort to produce increasing numbers of adult sockeyes without adversely affecting coho salmon production, as mandated by Board of Fisheries policy, CIAA undertook a sockeye stocking program beginning in 1989 with the release of 2.2 million sockeye fingerlings. Since then, additional releases of fry, fingerlings, and accelerated growth ("zero check") smolts have occurred, ranging from 0.2 to 2.4 million juvenile sockeye salmon each year (Appendix Table 31).

The first year of adult returns in 1992 was discouraging, with a total of less than 2,000 fish, but returns increased during each of the following three seasons. The return in 1996 was almost identical to that of 1995, totaling nearly 53,000 sockeyes, the highest to date. Since 1996, returns have not met the system's hypothesized potential.

With the liberal five-day-per-week fishing schedule in place again this year, which allowed substantial harvest opportunity for the fleet, seine harvests for the season amounted to 22,600 sockeyes in Resurrection Bay, the highest total since the 1996 season. CIAA cost recovery harvests at the Bear Lake weir totaled an additional 8,600 sockeyes. The harvests, when

combined with an escapement of 7,800 fish into Bear Lake, pushed the total return of sockeyes to about 39,000 fish. Approximately 1.38 million sockeye fry were released into Bear Lake during 1999 (Appendix Table 31), while 2.44 million sockeye eggs were collected for incubation over the 1999-2000 winter at Trail Lakes Hatchery in Moose Pass.

Grouse Lake Sockeye Salmon Stocking

A relatively new sockeye enhancement project at Grouse Lake in Resurrection Bay of the Eastern District was expected to produce an adult return of up to 157,000 fish in 1999. However, the failure of the first two years' returns in 1996 and 1997, and the increased but still less than forecasted return in 1998, left this season's projection questionable. All returning fish were designated for hatchery cost recovery in accordance with the Trail Lakes Hatchery Basic Management Plan. Brood stock for this project, from Packers Lake on Kalgin Island in Upper Cook Inlet, were selected for late run timing characteristics so as not to overlap with the earlier Bear Lake sockeye return. For the first time since inception of this stocking program, the Grouse Lake return showed promise in 1999, with over 100,000 adults documented. Unfortunately, all enhanced returns to this system have been plagued by poor product quality due to fresh water marking. CIAA has been actively investigating alternative fry release sites, closer to salt water, in order to increase the product quality of returning adults. Additionally, the organization intends to alter their cost recovery strategy, also utilizing a site(s) closer to salt water, in an effort to increase product quality. No sockeye smolt or fry were released into Grouse Lake in 1999.

Chenik Lake Sockeye Salmon Enhancement

Chenik Lake, located in Kamishak Bay, historically was an excellent sockeye producer prior to the 1940's when annual runs approached 150,000 fish. Since that time, however, sockeye runs declined dramatically, forcing a complete closure of the Chenik area fishery beginning in 1952. By the mid-70's the average annual return to this system was less than 500 fish.

In 1978 ADF&G initiated a program to re-establish the sockeye runs and subsequently increase commercial fishing opportunities in the Kamishak Bay area. Sockeye fry from the now closed Crooked Creek Hatchery were annually stocked in Chenik Lake through 1996, and a partial migrational barrier at the intertidal mouth of Chenik Creek was modified to allow easier fish passage. Beginning in 1987, lake enrichment occurred through the experimental application of liquid fertilizer, but not on an annual basis. Increased sockeye escapements in the early 1980's augmented production, and the Chenik area was reopened to commercial fishing. Subsequent returns accounted for up to 50% of the total LCI commercial sockeye harvest in some years, approaching the historical record high runs of the 1930's.

In 1999, however, the sockeye return to Chenik Lake was the sixth consecutive sub-par run, with no commercial harvest and an estimated escapement of only 2,850 adults (Appendix Table 16). The lingering effects of Infectious Hematopoietic Necrosis Virus (IHNV), a disease commonly affecting both juvenile salmon and trout, have caused reduced adult returns in recent years. IHNV was documented in the Chenik system during the 1991, 1992, and 1993 smolt outmigrations, and is suspected of causing increased mortality to juvenile sockeyes, thereby reducing the adult returns. A thorough investigation of the relationship between the Chenik Lake sockeye stocking project and the IHNV problem was initiated during the winter of 1992-93, ultimately resulting in a staff recommendation to reduce fry stocking densities from peak levels occurring in 1989 and 1990.

Between 1991 and 1996, the outmigration of sockeye smolts at Chenik Lake was monitored through the use of a weir and live trap. However, due to the low adult returns and smolt outmigrations during the past few years, operation of the smolt weir after 1996 could not be justified.

Factors relating to IHNV epizootics are very complex and currently not well understood. Although remotely possible that stocked sockeye salmon fry were the source of the virus, a more likely cause is that Chenik Lake has become a reservoir for IHNV released from the sex products of naturally spawning adult sockeyes or their decomposing carcasses. It has been hypothesized

that the tremendous population declines experienced by the sockeye stock at Chenik Lake in the late 1930's and 1940's may have resulted from IHNV epizootics caused by record high escapements of up to 53,000 adults in the 1930's.

Unfortunately, there is no known practical onsite treatment of IHNV other than perhaps decreasing fry stocking densities, which was begun in 1993 with a reduction to just over one million sockeye fry (Appendix Table 31). This experiment was inadvertently stretched to its maximum limit by default in 1994 when no hatchery-produced fish were released into the system. The fry from Crooked Creek Hatchery, which were slated for stocking at Chenik Lake that year, were destroyed due to an outbreak of the IHN virus at the hatchery facility. It should be noted that this was the first documented incidence of IHNV at the Crooked Creek facility in its 23 years of operation. Stocking resumed in 1995 with the release of 1.13 million sockeye fry into Chenik Lake, while just under 1.0 million fry were stocked in 1996 (Appendix Table 31).

It was thought that reduced adult escapement would also help to decrease transmission of IHNV into the littoral zone of Chenik Lake. Escapement into Chenik Lake, monitored via aerial surveys once again in 1999, totaled only 2,850 fish, the seventh consecutive year in which the escapement has fallen substantially short of the 10,000 fish goal (Appendix Table 23). The escapement shortfall, when combined with the discontinuation of supplemental stocking, equates to reduced fry production, which in turn should theoretically benefit the system by reducing the potential for IHNV epizootics. Furthermore, informal studies indicated that the resident lake trout population in Chenik Lake undoubtedly benefited from the regular stocking of sockeye fry. Evidence suggests that the inflated lake trout numbers may be continuing to suppress juvenile sockeye levels in the lake, thereby reducing the size of annual smolt outmigrations.

The aforementioned schemes of reduced adult escapements and decreased stocking levels appeared to successfully reduce the incidence of IHN in the system as evidenced by the healthy smolt leaving the lake from 1994 - 1996. Unfortunately, the numbers of outmigrating smolts during that time were miniscule relative to the stocking levels, and measures taken failed to achieve the expected increase in production at Chenik Lake. As a result, CIAA could no longer

justify the expense of stocking Chenik Lake and discontinued the project after the 1996 season. The Department and CIAA will continue to include Chenik Lake in future enhancement considerations, but new information will undoubtedly be required before any projects are undertaken at the system.

Other Sockeye Salmon Lake Stocking

One other LCI lake was stocked in 1999 with sockeye salmon fry produced by Trail Lakes Hatchery. At Kirschner Lake in the Kamishak Bay District, site of an ongoing fry stocking project since 1987, approximately 173,000 fry were stocked (Appendix Table 31), a reduction from recent years due to hatchery incubation and rearing problems. Four other lakes, evaluated through pre-stocking studies conducted between 1986 and 1989, and which were regularly stocked during recent years, were again not stocked in 1999 as those enhancement programs have been discontinued. The four lakes included Bruin Lake, Ursus Lake, Upper Paint Lake, and Lower Paint Lake, all in the Kamishak Bay District (Appendix Table 31).

The tenth year of adult sockeye returns to Kirschner Lake occurred in 1999. Additional fish, albeit in very small numbers, returned to nearby Bruin Lake, also previously stocked with sockeye fry. The overlapping harvest areas, and the absence of any tagged fish, precludes separation of the returns for purposes of enumeration. The total combined return to Kirschner and Bruin Lakes was estimated at about 39,000 sockeyes, exceeding the preseason forecast for the Kirschner system. An estimated 800 unharvested sockeyes were documented in salt water at Kirschner Lake during August aerial surveys, unable to reach the lake due to the steep falls at tide line. The Kirschner Lake system has remained one of the steadiest producers of LCI stocked lakes since the inception of the program at that site.

Halibut Cove Lagoon Chinook Salmon Enhancement

The chinook salmon enhancement project at Halibut Cove Lagoon involves the release of chinook salmon smolts, with the objective of increasing sport fishing opportunities in Kachemak

Bay. This is the oldest and one of the most popular sport fishing enhancement projects in LCI, operating continually with an annual release of smolts since 1979. Although adult returns from the Halibut Cove Lagoon stocking program are not intended for commercial harvest, there is incidental harvest of these chinook salmon in the commercial set gillnet and seine fisheries. The long-term estimated incidental harvest of enhanced chinook salmon by commercial fishermen in Halibut Cove Subdistrict has been approximately 30% of the total return. Figures for this incidental harvest during 1999 were not available but were thought to be near the historical average.

Port Graham Hatchery

In an effort to supplement natural fish production and provide increased employment opportunities in the native village of Port Graham, the Port Graham Hatchery Corporation (PGHC) applied for and received a permit to operate a private non-profit (PNP) hatchery in 1992. Port Graham is located approximately 21 nautical miles southwest of Homer on the south side of Kachemak Bay (Figure 2). The hatchery had conducted experimental egg-takes and fry releases via a scientific/educational permit from 1990 through 1992, while these activities have since been permitted in the Port Graham Hatchery Basic and Annual Management Plans (BMP/AMP). Adult returns to the hatchery failed to appear in both 1992 and 1993 despite predictions of at least moderate returns. Because no fry were released in 1993, both the forecast and actual return for 1994 were zero. The 1995 pink return to Port Graham Hatchery was forecasted at 20,000 to 50,000 fish, with the actual return totaling an estimated 20,000 pinks, while only 2,700 fish returned in 1996, when the preseason forecast called for 7,000 to 10,000 returning pinks. In 1997, returns finally achieved the preseason forecast of 80,000 to 200,000 pinks, with a total run size estimated at about 130,000 fish. Despite a forecast of 30,000 to 50,000 fish in 1998, the return totaled less than 13,000 pinks. Because of the fire in January 1998 that destroyed all of the hatchery pinks and sockeyes in incubation at the time, no pink salmon returned to the hatchery in 1999.

The PNP permit for PGHC allows pink salmon brood stock collection from a natural run in the Port Graham River, at the head of Port Graham. However, the Port Graham River pink run historically has experienced significant natural fluctuations in escapements despite conservative fishing schedules, causing some concern for protection of the natural stocks. Consistent with the priority of managing for natural stocks (AS 16.05.730), a brood stock collection schedule based on the desired natural escapement into Port Graham River as well as historical escapement levels has been developed to offer maximum protection to the wild pink salmon stock during years of weak returns. Harvest of returning hatchery stocks could potentially occur in commercial purse seine and set gillnet fisheries as well as a subsistence set gillnet fishery in Port Graham. Hatchery fish undoubtedly intermix with wild stocks bound for the Port Graham River. Management decisions attempt to address the effects of these various fisheries to protect natural stocks until adequate escapement into Port Graham River can be confirmed. A small natural return of chum salmon to Port Graham River also occurs, and since this run has been depressed in recent years, management measures also strive to protect this species as well.

The approved Port Graham Hatchery BMP designated a Special Harvest Area (SHA) to allow for brood stock collection and cost recovery harvest (Figure 7). The SHA was designed to provide a migration corridor on the northeast side of the bay for wild stocks traveling to Port Graham River at the head of the bay, thus affording some limited protection to the natural spawning stocks of pink and chum salmon. With no fish returning to the hatchery this season, however, PGHC was relying on the return of wild stocks to Port Graham River for brood stock, with a threshold of 6,000 fish documented as escapement before brood stock harvest could begin. Unfortunately, Department ground surveys in August provided evidence that the natural return was a bust, with less than 500 pinks counted during a survey on August 17 and only 9,700 fish estimated as final escapement.

In response to the poor natural return, PGHC appealed to ADF&G for a special one-time permit to remove pink salmon adults for brood stock from nearby English Bay River so as to forestall another interruption in production at the facility. The Department issued this permit,

with an egg removal schedule that included a threshold of 3,000 pinks documented in English Bay River necessary to trigger a harvest of brood stock from that system. Fortunately, the return to English Bay River exceeded the established threshold and PGHC was able to collect a total of 1,300 pink salmon adults, extracting an estimated 1.3 million eggs for incubation over the winter of 1999-2000.

Although all efforts prior to 1993 were directed towards pink salmon, sockeye salmon production has been underway at the Port Graham Hatchery. The facility has incubated sockeye salmon eggs collected from English Bay Lakes, destined for release back into that system, since 1993 (eggs from this collection site were formerly incubated at Big Lake Hatchery near Wasilla). A total of 1.371 million sockeye salmon eggs were collected from English Bay Lakes brood stock for incubation this past season.

In an effort to rehabilitate depressed coho salmon stocks in Port Graham River, a Permit Alteration Request (PAR) by PGHC to produce approximately 25,000 presmolts for stocking in the upper portion of Port Graham River was approved in 1995. PGHC began to monitor the smolt outmigration from that system in 1996 and collected eggs from adults beginning that same year. These eggs were incubated at the Port Graham hatchery and the resultant fry were subsequently released into Port Graham River. The first adult returns from this stocking program were expected in 1999. However, the project was discontinued after the 1998 release and its future is currently uncertain.

The Port Graham Hatchery continued to recover from the devastating fire in January 1998 that completely destroyed the Port Graham Cannery, which also housed the pink and sockeye salmon modules for the Port Graham Hatchery. Because the coho salmon module was housed separately from the cannery, that portion of the facility remained intact. Since the coho program was discontinued after the 1998 releases, the coho module was converted to pink and sockeye incubation so that those projects could continue after eggs were collected at the end of the 1998 field season. Construction of the new cannery was completed and the cannery

operational during the summer of 1999, while work on the hatchery complex continued into the fall of 1999 and was completed over the winter.

Paint River Fish Pass

The Paint River system in the Kamishak Bay District contains at least 40 kilometers (25 miles) of potential salmonid spawning and rearing habitat. Currently the Paint River system is barren of salmon because of a waterfall at tide line that was impassable prior to 1993. ADF&G and CIAA initiated feasibility studies for a fishway in 1979. CIAA received State and Federal grant funds to build the fishway, completing construction in the fall of 1991. ADF&G Commissioner Carl Rosier declared the fish pass officially operational in January 1993.

To test the feasibility of developing a sockeye salmon return to the fish pass project site, the Paint River Lakes were first stocked with sockeye fry in 1986 and annually from 1988 through 1996, except in 1994 when no fry were available (Appendix Table 31). Because adult returns from these plantings have been negligible, CIAA discontinued fry stocking after the 1996 season.

A peak of 900 adult sockeyes was observed during aerial surveys of the Paint River mouth and Akjemguiga Cove during 1999, the ninth consecutive year of meager returns to this enhancement site. Because of the small numbers of returning fish, the fish pass was not opened to migrating salmon and no freshwater escapement occurred.

2000 COMMERCIAL SALMON FISHERY OUTLOOK

Sockeye Salmon

Adult sockeye salmon harvests in LCI during 2000 could exceed 485,000 fish and, if realized, would set a new record catch for this species in LCI. Such a catch would also represent nearly

twice the average annual catch of 249,000 sockeyes experienced during the last decade. Over 80% of the total sockeye harvest should be a result of continuing enhancement and lake stocking projects in LCI. However, this projection could be somewhat misleading in that nearly 40% of the entire harvest is projected to return to Grouse Lake in Resurrection Bay and is therefore allocated specifically for hatchery cost recovery in accordance with the Trail Lakes Hatchery Basic Management Plan.

Beneficial results of Leisure Lake fertilization should once again be evident in 2000, with an expected return of almost 100,000 sockeyes to China Poot Bay. An additional 55,000 sockeyes are expected to return to Neptune Bay/Hazel Lake based on annual stocking rates and historical survival. This optimistic forecast was fostered by the stocking of much higher than average size sockeye fry in 1997, a significant percentage of which are expected to return as 2-ocean adults in 2000.

No harvest is expected to occur at Chenik Lake in 2000. An IHNV epizootic apparently caused significant mortality to juvenile sockeyes and reduced the numbers of emigrating smolt from the system in recent years. The 1994 - 1999 adult returns continued to display significant effects of the IHN outbreak, as escapements into Chenik Lake have ranged from 800 to 3,000 fish during those years. All available information suggests that the 2000 return will likely be poor as well. Additionally, informal predation studies conducted during previous seasons indicated that resident lake trout in Chenik Lake could also be a major contributing factor in juvenile sockeye salmon survival.

Kirschner Lake in the Kamishak Bay District is expected to produce 30,000 adult sockeyes in 2000. This projection is based on consistent stocking rates and resultant adult returns and commercial harvests over the past decade. Stocking in other Kamishak Bay systems, such as Bruin, Ursus, and Paint River Lakes, has now been discontinued, and these systems are not expected to produce harvestable sockeye returns in 2000.

The 2000 enhanced sockeye return to Bear Lake (ninth year of enhanced returns) is expected to produce a harvest of 21,000 fish, down from the previous year's actual return. The fifth year of enhanced sockeye returns to Grouse Lake, also near Seward in Resurrection Bay, is expected to be considerably greater than recent years' returns, with optimistic estimates ranging up to 183,000 sockeyes. Since brood stock for this project was specifically selected for late run timing, it is anticipated that the Grouse Lake return will peak in late July or early August and therefore not overlap with the much earlier run timing of Bear Lake sockeyes. As previously stated, the Grouse Lake return is designated entirely for CIAA hatchery cost recovery and no common property harvest of these fish is anticipated.

Natural sockeye run projections for LCI are based solely on average historical harvests and could be expected to contribute up to 88,000 fish to commercial catches in 2000. Despite not reaching the preseason projection during recent years, natural sockeye runs have nevertheless been improving, with a concurrent improvement in spawning escapements to most systems. The Southern District is expected to contribute the most to the harvest of natural stocks, while additional catches could come from the East Nuka Bay systems of Delight and Desire Lakes in the Outer District, Aialik Lake in the Eastern District, and Mikfik Lake in the Kamishak Bay District.

Pink Salmon

Harvest of pink salmon in LCI during 2000 could reach 1.8 million fish, with enhanced production expected to provide two-thirds of the total. However, if prices for this species continue to remain depressed, and tender service in remote districts is again erratic, it is unlikely that the harvest forecast will be attained even if returns are strong. Tutka Hatchery, in the Southern District, is expected to contribute up to 1.2 million pinks to commercial harvests. With a hatchery revenue goal of \$425-450,000 set for 2000, only about one-third to one-fourth of the pink return is expected to be available for common property harvest.

Natural spawning escapement levels into most major LCI systems were generally good in 1998, contributing to a harvest projection of 670,000 naturally produced pinks throughout the entire LCI management area. Outer District systems are expected to harbor the greatest potential for harvest with a combined projection of over 490,000 pinks, returning primarily to Port Dick, Rocky Bay, and Nuka Island drainages.

Chum Salmon

Based solely on recent years' average harvests (after 1988), the total LCI commercial chum salmon catch could be as high as 10,000 fish during 2000. The LCI chum harvest will consist exclusively of natural production since chum salmon enhancement is no longer conducted in LCI. Despite optimism for chum salmon during recent years, actual harvests during the past eleven seasons have failed to meet the preseason projections by substantial amounts, suggesting that the average used to generate the forecast may be overly optimistic for 2000 as well.

Chinook and Coho Salmon

No formal harvest forecast is prepared for chinook or coho salmon in LCI. However, average annual harvests since 1980 indicate that about 1,300 chinook and 15,000 coho salmon can be expected to contribute to LCI commercial harvests in 2000.

The following table summarizes the projected harvest figures by species in the Lower Cook Inlet management area during 2000:

| Species | Harvests of Enhanced Returns | Harvests of Natural Returns | Total Harvest |
|--------------|---------------------------------|--------------------------------|---------------------|
| Chinook | ^a | ^a | 1,300 ⁿ |
| Sockeye | 399,000 ^c | 88,000 ^b | 487,000 |
| Coho | ^a | ^a | 14,700 ^a |
| Pink | 1,212,000 ^c | 670,000 | 1,882,000 |
| Chum | 0 | 10,200 ^b | 10,200 |
| TOTAL | 1,611,000 | 768,200 | 2,395,200 |

^a Commercial harvest forecasts of chinook and coho salmon represent average harvests since 1980 and are comprised of a combination of naturally-produced fish as well as fish produced from enhancement programs in LCI; no attempt is made to separate the two components.

^b Harvest forecasts for naturally-produced sockeye and chum salmon are simply average commercial harvests since 1980 and 1989, respectively.

^c Includes common property plus cost recovery harvests.

SUBSISTENCE AND PERSONAL USE SALMON NET FISHERIES

KACHEMAK BAY PERSONAL USE FISHERY

The Southern District (Kachemak Bay) fall coho salmon gillnet fishery dates back prior to statehood under varying names, being known as a “subsistence” fishery in 1991, 1992, and 1994, and as a “personal use” fishery during the years 1986-1990, 1993, and 1995-present. Numerous court rulings have affected the status of this fishery over the past 15 years, causing it to change in status between the two categories. The most recent court action, after the 1994 fishery, reestablished the “subsistence” and “non-subsistence” areas originally created by the Alaska Board of Fisheries in 1992, and because most of Kachemak Bay was included in a “non-subsistence” area, the subsistence fishery and the regulations governing it were no longer valid. The Board responded by rescinding the subsistence regulations formerly governing the fishery and re-adopting personal use regulations into permanent regulation for the 1995 season. Those personal use regulations have remained in effect since that time.

The target species in the Kachemak Bay gillnet fishery is coho salmon. Returning fish are a mixture of natural stocks primarily bound for the Fox River drainage at the head of Kachemak Bay and enhanced runs bound for the Homer Spit fishing lagoon and, formerly, Fox Creek

near the head of Kachemak Bay. The regulations governing the fishery are found in the Personal Use Coho Salmon Fishery Management Plan (5 AAC 77.549), which directs the Department of Fish and Game to close the fishery when an estimated 1,000 to 2,000 coho salmon are harvested. This guideline harvest level (GHL) was new for the 1999 season, having been reduced by the Alaska Board of Fisheries in November 1998 from a former range of 2,500 to 3,500 cohos. Included in the guideline harvest range is a requirement that any cohos taken during the Seldovia area subsistence salmon fishery be included as part of the personal use guideline.

All other regulations from the previous year's fishery remained essentially unchanged for the 1999 personal use fishery. The published regulatory season for the fishery was August 16 through September 15. Legal gear was limited to a single set gillnet not exceeding 35 fathoms in length, 45 meshes in depth, and 6 inches in mesh size. Nets were not permitted more than 500 feet from the mean high water mark, and a net could not be set offshore of another net. A permit from the Homer office was required, with an Alaska resident sport fishing license necessary to obtain a permit. The seasonal limit was 25 salmon per head of household and 10 additional salmon per each dependent. There were two scheduled 48-hour fishing periods each week, from Monday 6:00 a.m. until Wednesday 6:00 a.m. and Thursday 6:00 a.m. until Saturday 6:00 a.m.

Prior to 1991, little Department management interaction occurred and the fishery often proceeded until the regulatory closing date of September 15, regardless of the harvest level. Between 1991 and 1998, years of intensive management for the GHL, the average fishing time allowed in this fishery was 48 to 192 hours, or one to four regularly scheduled fishing periods. Additionally, the 1997 and 1998 fisheries were closed prior to achieving the former low end (2,500 cohos) of the guideline harvest range.

No coho salmon harvest was reported from the early August Seldovia subsistence fishery, therefore the guideline harvest range remained at 1,000 to 2,000 fish for the personal use fishery.

As has been the case during recent personal use fisheries in LCI, the Department requested voluntary daily reporting from each permit holder during the fishery. Based on those voluntary reports through the first two periods (96 hours) of fishing, early reports from the third fishing period, and fishery performance data from the previous eight years, attainment of the low end of guideline harvest range by the end of the third (48-hour) open fishing period on Wednesday, August 25, was questionable. At this point, assessment of coho run strength was mixed, with the gillnet catches appearing average while observations in the local sport fishery suggested a weak return. A common trait in both fisheries was that the run timing for cohos seemed slightly late.

As has become common in the personal use fishery, effort and harvest were greatest on the east side of the Homer Spit. A new project initiated by Sport Fish Division this year to collect tag recovery information in this area indicated that the majority of the fish being harvested by gillnets were of hatchery origin. Since attainment of the GHF by the end of the third fishing period was uncertain, and because numbers of naturally produced fish in the gillnet harvests appeared to be low, the staff determined that another fishing period would likely allow the harvest to fall within the guideline harvest range without exceeding the upper limit. The Department therefore announced that the fishery would open for one additional (fourth) period beginning at 6:00 a.m. Thursday, August 26; at the end of that period at 6:00 a.m. Saturday, August 28, the fishery would close for the remainder of the 1999 season.

A total of 146 permits were issued for the 1999 fishery (Appendix Table 26). Approximately 97%, or 141 permit holders, reported their catches by phone or returned permits. Of this number, 111 permit holders (76%) actively fished, 30 (21%) did not fish at all, and the remaining five permit holders (3%) did not report. A total of 140 permit holders (96%) actually returned their permits. Based on permits actually returned and voluntary catch reports, the harvest was estimated to be 1,803 coho salmon (Figure 2), 168 pink salmon, 119 sockeye salmon, 276 chinooks, and 3 chums (Appendix Table 26).

The duration of the 1999 Southern District personal use fishery (192 hours of fishing time) was identical to the previous year, equaling it for the longest duration since intensive management

was implemented in 1991. The number of permits issued was significantly less than the past five years and the lowest total since 1973 (Appendix Table 26). Actual fishing effort was identical to that of 1998 but down from previous seasons, representing only about one-third of the peak level experienced in 1990 and the lowest since 1974. The coho harvest of 1,803 fish was greater than that of 1998 but identical to 1997.

Reasons for the lower effort during the 1999 fishery likely included the increased popularity of, and participation in, available alternative personal use and sport fisheries in Upper Cook Inlet (UCI). Several gillnet, dipnet, and hook-and-line fisheries there, targeting the highly prized sockeye salmon, undoubtedly attracted considerable numbers of fishermen who might ordinarily participate in the Southern District coho personal use fishery. Additionally, a permit for UCI personal use fisheries is separate from that for the Southern District fishery, and regulations prohibit a household from obtaining more than one Cook Inlet personal use permit in a given calendar year. Finally, the new, lowered GHL probably discouraged many potential fishermen from attempting to fish or even obtaining a permit.

The actual amount of fishing time in the 1999 personal use fishery was expected. Because the Caribou Lake stocking project was discontinued, fish from that project no longer contribute to the personal use catches. Experience in managing this fishery over the past decade, especially during the past two seasons, suggested that the new, lower GHL would likely be achieved after three or four 48-hour fishing periods. Inseason call-ins and postseason permit returns bore out this prediction. As expected, the most fishing success occurred in those waters adjacent to the Homer Spit enhancement lagoon. Other areas that produced reasonable catches during years of Caribou Lake enhancement, especially the north shore of Kachemak Bay from Mud Bay to Swift Creek, were not expected to produce significant harvests and indeed didn't. The lower GHL implemented this year appears to have succeeded at protecting the majority of naturally produced cohos by prompting a closure prior to the peak of that segment's migration.

Overall run strength of coho returns this year appeared to be average to slightly below average. Sport and commercial catches are normally utilized as indicators of run strength, but as has

become commonplace in recent years, commercial catches in LCI did not accurately reflect the strength of the 1999 coho return due to a lack of directed effort. Informal observations in the local sport fisheries, especially on the Homer Spit, indicated only fair returns, but some observers believed that the coho entry pattern into the Spit enhancement lagoon may have been altered by recent modifications to that site. Harvest rates in the personal use fishery were considered normal for an average return.

Due to the abbreviated nature of the personal use fishery during most of this decade, which has become common knowledge among experienced local participants, the staff made a concerted effort prior to the opening to inform the public of the anticipated short duration again in 1999. As usual, this prior knowledge of the brevity of the fishery led to intense competition for desirable fishing sites, especially along the east side of the Homer Spit. This area continues to remain the most sought after location to fish, undeniably due to the coho enhancement project at the Homer Spit fishing lagoon.

Prior to enhancement, the Spit was considered only average in terms of harvest productivity. The Spit's easy road access and the enhanced coho return have combined to incite fishermen to clamor for fishing sites on the Spit, a situation which resulted in numerous violations during some previous gillnet fisheries. The last time that Fish and Wildlife Protection (FWP) officers issued citations during this fishery was in 1994, and enough time has elapsed that many participants this year apparently felt that the enforcement of fishery regulations, and subsequently the need to adhere to them, was no longer a priority. The Homer ADF&G office once again received numerous complaints of violations, suggesting that pre-fishery cautionary warnings contained in summary handouts were not sufficient to deter violations this season. The on-grounds FWP enforcement effort, which occurred during three of the four open fishing periods, resulted in issuance of approximately eight verbal warnings, primarily for nets closer than the minimum distance apart. As is usually the case, the presence of these uniformed FWP officers generated relatively expedient voluntary compliance, and no formal citations were issued.

The 1999 catch of 276 chinook salmon was the third highest on record and much greater than the long-term average (Appendix Table 26). The primary reason for this above-average chinook harvest was due to significant numbers of adult fish returning to the enhancement lagoon on the Homer Spit as a result of the "late run" stocking project. Begun in recent years, this project specifically selected brood stock for late run-timing characteristics in an effort to expand and prolong sport fishing opportunities for chinooks on the Homer Spit. The late run timing of returning adults overlapped the personal use season dates and, consequently, resulted in increased gillnet catches of chinook salmon, particularly along the Homer Spit.

Two aerial surveys of Clearwater Creek, the major coho index stream at the head of Kachemak Bay, were conducted in September to gauge escapements. An estimate of 270 cohos generated during the first survey, near the beginning of the month, was only fair when compared to historical figures, but this survey was considered "early" in relationship to the traditional timing of the freshwater migration. The second survey on September 24 confirmed this assessment as about 650 cohos were estimated, a figure deemed quite good. Unfortunately, heavy rains in the area during most of September precluded additional surveys.

The personal use fishery in 2000 is expected to be very comparable to that of 1999. Fishing effort and participation is expected to be similar to that of 1999 but, once again, could be affected by other alternative fisheries elsewhere in Cook Inlet. Although limited as an inseason management tool, voluntary catch reports will once again be employed to help determine an appropriate closure time. Based on experience gained during the past nine years' fisheries, and especially that of the past three seasons, it should be possible to keep the harvest within the guideline harvest range of 1,000 to 2,000 cohos.

NANWALEK/PORT GRAHAM SUBSISTENCE FISHERY

One of two subsistence fisheries in LCI during 1999 occurred near the villages of Nanwalek (formerly English Bay) and Port Graham, located approximately 21 nautical miles southwest

of Homer on the south side of Kachemak Bay (Figure 2). Most fishing occurs within close proximity to the respective villages and targets sockeye salmon returning to the English Bay Lakes system early in the summer and pink salmon returning to Port Graham and English Bay Rivers later in the summer. Some additional fishing also occurs in Koyuktolik ("Dogfish") Bay, located about seven nautical miles south of English Bay, targeting non-local stocks of chinook salmon as well as local stocks of chum salmon.

The sockeye salmon run to English Bay Lakes was severely depressed for much of the late 1980's and early 1990's, with returns failing to achieve the minimum escapement goal for nine consecutive years between 1985 and 1993. Recent returns have been bolstered as a result of a rehabilitation/enhancement project initiated by ADF&G and subsequently taken over by the Chugach Regional Resources Commission (CRRC) on behalf of the village of Nanwalek. Unfortunately, after three straight years of commercially harvestable surpluses, the sockeye return in 1999 was projected to exceed the spawning escapement requirements by only a small amount. As a result, a closure was imposed on the commercial fishery for the entire season, but the subsistence and sport fisheries were allowed to open. The subsistence fishery remained open on the regular schedule of two 48-hour periods per week for the entire season as the staff felt that this would allow opportunity for Port Graham and Nanwalek village residents to meet their salmon subsistence needs without unduly jeopardizing escapement into the lakes. An enumeration weir operated by CRRC monitored escapement inseason as has been the case since 1994.

The strategy seemed to succeed as catches in both villages appeared adequate, and the sockeye escapement goal for English Bay Lakes was also met. The cumulative all-species catch of just over 1,500 salmon in Port Graham was greater than the previous two seasons but down slightly from the average (since 1981), while the harvest in Nanwalek set a new record of over 6,900 salmon, with catches for all individual species well above average. Historical subsistence harvests from both these areas appear in Appendix Tables 28 and 29.

SELDOVIA AREA SUBSISTENCE SALMON GILLNET FISHERY

A set gillnet fishery in the waters near Seldovia (Figure 2) on the south side of Kachemak Bay in 1999 was the fourth year of LCI's newest subsistence salmon fishery. Established by the Alaska Board of Fisheries at their LCI meeting in the fall of 1995, the fishery was designed to primarily target non-local stocks of chinook salmon as they transited these waters. In considering initial seasons and bag limits, the Board carefully restricted the fishery to reduce potential interception of enhanced chinook salmon bound for a popular stocking site in the Seldovia small boat harbor. These enhanced fish were intended to principally benefit sport fishermen and were not considered "customary and traditional" for subsistence purposes.

Regulations in the fishery included a "split" season, the first occurring from April 1 through May 30 and the second occurring during the first two weeks of August. A guideline harvest limit of 200 chinook salmon was established for the early season, while the annual possession limit was set at 20 chinooks per household. During the April/May season, fishing was allowed during two 48-hour periods each week, while in August the fishery was only open during the first two weekends of the month. Waters open to fishing included those along the eastern shore of Seldovia Bay as well as a short stretch of water outside of Seldovia Bay proper just west of Point Naskowhak (also called the "outside beach"). Gear was limited to set gillnets not exceeding 35 fathoms in length, 45 meshes in depth, and six inches (stretched) mesh size, identical to gear regulations governing the nearby Port Graham/English Bay subsistence fishery. A permit issued by the Department was required prior to fishing, and catches were to be recorded on the permit and also voluntarily reported to the Department's Homer office inseason so that cumulative harvest totals could be monitored.

A total of 16 permits was issued for the early season, while no permits were issued for the August season. Although permit holders are required to call in their catches inseason, few actually do. At the close of each season, nearly all permits were returned to the Department as required by regulation, and catches were determined from records on each permit. For the early season, 12 of 16 permit holders (75%) actively fished, three (19%) did not fish, and the

remaining permit holder (6%) failed to return his/her permit. Total reported catch was 150 chinook salmon, 130 sockeyes, and 38 chums (Appendix Table 30). The harvest figures for the early season in 1999 are all increases from the previous two years and can be attributed to a longer season for the second straight year (the Board of Fisheries adopted a 10-day extension for the early season, from May 20 to May 30, beginning with the 1998 season). The extra time equated to more chinook and sockeye salmon in Seldovia area waters, subsequently increasing subsistence harvests. In addition, participants continue to gather more knowledge on fishing techniques and productive locations.

The fishery in 2000 is expected to be very similar to that of 1999. Because the fishery is still relatively new, fishermen are continuing to learn the most productive fishing sites and successful techniques. Based on these factors, the harvest during the early season could approach or exceed the guideline harvest limit in 2000.

COMMERCIAL HERRING FISHERY

INTRODUCTION

Similar to salmon management, the LCI herring management area is divided into five separate fishing districts, with commercial herring fishing historically occurring in all but the Barren Islands District (Figure 1). Herring fishing began in the Southern District in 1914 as a gillnet fishery within Kachemak Bay. Eight saltries, six near Halibut Cove, were operating during the peak of the fishery. Fishing with purse seines began in 1923, and after three subsequent years of average annual harvests approaching 8,000 short tons (st), herring populations, along with the fishery, collapsed.

The next LCI herring fishery began in 1939 and was centered in the Resurrection Bay and Day Harbor area of the Eastern District. This was a purse seine fishery with the product used exclusively for oil and meal reduction. Peak harvests occurred from 1944 through 1946,

averaging 16,000 st each year, but stocks sharply declined thereafter, apparently due to overexploitation.

Japanese markets for a salted herring roe product resulted in development of a sac roe fishery in the 1960's. Market demand and the relatively high prices paid to fishermen caused rapid expansion of the fishing fleet and harvest. Although Department management and research efforts lagged behind the rapid growth of the fishery, conservative management strategies and guideline harvest levels were established in response to historical overexploitation of the herring fisheries statewide.

1999 SEASON SUMMARY

For the first time since 1984, all of the LCI management area was closed to commercial herring fishing for the entire season. The preseason forecast for herring in Kamishak Bay District, where the commercial sac roe fishery has traditionally occurred, predicted a total biomass range of 6,000 to 13,000 st. Since this projection suggested that stocks could be below the threshold of 8,000 st for which a commercial harvest may occur, the staff felt it prudent to preclude a fishery in order to provide maximum protection to the stocks during the spawning migration. Appendix Table 32 lists historical harvests by district in the LCI herring fishery.

Due to invariably poor weather and water clarity, aerial surveys rarely provide reliable estimates of total biomass returning to Kamishak District Bay waters (Otis et al. 1998). As a result, an age-structured-analysis (ASA) model has been used for the past seven years to forecast herring abundance for Kamishak Bay, as well as to "hindcast" previous years' total abundance. This model incorporates a variety of heterogeneous data sources including: times series of commercial catch age composition; total run age composition; and aerial survey biomass estimates from years with adequate survey conditions and coverage. The model simultaneously minimizes the differences between expected and observed return data for each of its components, updates

hindcasts of previous years' abundance, and returns a forecasted estimate of the following year's return. The ASA model estimated the total 1999 return at 5,800 st (Otis 2000b; Appendix Table 34), the third consecutive year with an abundance less than 8,000 st. Although no commercial fishery occurred, the Department did conduct two test fishing charters to collect samples for age composition. Herring ages 5-7 dominated samples (Table 10), while the exceptionally strong 1988 cohort, which had been the primary component in the fishery for many years, continued to decline. The Department also harvested and sold a cumulative total of approximately 100 st of herring (Table 10) caught during the two charters in order to offset the expense of conducting this research.

No sac roe herring fishery occurred in the Southern District in 1999 as fish were never present in sufficient numbers to allow a harvest. The Outer and Eastern Districts also were not opened to purse seining in 1999. The historical predominance of young (age-3 and age-4) fish, roe recoveries historically below 10%, and the exploratory nature of the fishery, have discouraged interest by processors and fishermen in these two districts.

ASSESSMENT METHODS

Aerial surveys were conducted throughout the herring spawning season to determine relative abundance and distribution of herring in the Kamishak Bay and Southern Districts. Data collection methods were consistent with those used since 1990. Numbers and distribution of herring schools, location and extent of milt, and visibility factors affecting survey results were recorded on index maps for each survey. Standard conversion factors of 1.52 st (water depths of 16 ft or less), 2.56 st (water depths between 16 and 26 ft), and 2.83 st (water depths greater than 26 ft) per 538 square feet were used to convert estimated herring school surface areas to biomass.

In a departure from normal patterns, survey conditions in the Kamishak Bay District were relatively good throughout the 1999 herring migration, allowing the most thorough survey

coverage of the entire district since 1992. A total of 17 comprehensive surveys were completed in the Kamishak Bay District, covering the period from mid April to early June. One additional survey was opportunistically conducted in late June when a large group of herring was spotted in the area of McNeil Cove. Four surveys were completed in the Southern District, while no comprehensive surveys of the Outer and Eastern Districts were conducted this season.

Without a commercial fishery in the Kamishak Bay District, the Department was unable to utilize the fleet to collect samples for age composition analysis. However, for the fourth consecutive year, herring samples were collected throughout the district from two separate charters on a commercial purse seine vessel during the last few days of April and the month of May to further aid in understanding the dynamics of the Kamishak Bay herring stocks. During the 18 days spent in the district, the contracted vessel made a cumulative total of nine sets, resulting in the collection of nearly 4,000 fish for AWL samples. Additional hydroacoustic observations were concurrently accumulated during each charter. Analysis of the samples confirmed significantly higher percentages of younger age fish, particularly ages-3 and -4, during the second charter during mid/late May compared to those collected during the first charter in late April/early May. The information gathered during these sampling efforts provided age-class data that was essential in generating the 2000 herring forecast.

SPAWNING POPULATIONS

Kamishak Bay District

During the 1999 season aerial surveys to estimate biomass in the Kamishak Bay District were conducted from April 20 through June 2. The long winter and correspondingly late spring appeared to delay the herring migration, with herring first observed on May 4. The highest daily biomass observation during the traditional surveying period was made on May 17 with an estimate of 1,633 st. Test fishing documented a relatively high percentage of age-6 fish in the samples collected during the early charter conducted between April 26 and May 5. An increase

in younger age fish became apparent in the samples collected during the second charter between May 15 and 22, as percentages of age-3 and -4 herring were greater than those collected during the early charter. During an aerial survey conducted on June 24, two to three weeks after herring surveys typically end, 6,100 st of herring was documented in and around McNeil Cove. No formal samples from this group of fish was collected for analysis, but opportunistic samples collected by salmon seiners on the grounds at the time suggested these fish were primarily age-2.

As stated previously, the 1999 run was estimated at 5,800 st (Table 10, Appendix Table 35) using the ASA model. Postseason data analysis from combined test fishing sources, as well as the cost recovery harvests, showed that age-6 fish comprised the strongest year class this season, at one-third of the total biomass by weight (Table 10), followed in order of abundance by age-5 fish (22%) and age-7 fish (13%). The formerly dominant 1988 (age-11) year class of herring continued to decline, representing only 1% of the return by weight. Nearly 90% of the entire 1999 return was composed of fish age-7 and younger, while less than 2% was older than age-10 (Figure 15, Table 10). It must be emphasized that these figures represent overall biomass spanning the time period between mid-April and the end of May, since samples were obtained from the early and mid/late portions of the return. Prior to 1996, age composition samples usually were limited to the time period surrounding the commercial fishery in late April, or the earliest stages of the migration, thus making total run age composition estimation more difficult. Late season sampling efforts during the past four seasons confirmed the influx of younger fish, as was observed in previous years (Yuen 1994).

Nine sightings of spawning activity occurred during surveillance flights, considered quite numerous by recent standards but cumulatively amounting to just under four linear miles of spawn. Due to the often sporadic schedule of surveillance flights, however, no correlation between documented spawning and herring abundance was attempted. Therefore the high number of spawn sightings this year is not considered indicative of a strong herring return.

Southern District

Four aerial surveys of the Southern District were flown between May 14 and May 24, all conducted under relatively good conditions. The 1999 run biomass, estimated as the sum of all daily biomass estimates, was only 1,279 st. The peak individual biomass survey (561 st) occurred on May 14, with the majority of herring observed off "Miller's Landing" near Mud Bay. Peak surveys in areas where herring historically have been observed were as follows: Mallard Bay, 277 st on May 18; 378 st east of the Homer Spit/Mud Bay on May 14; and Glacier Spit/Halibut Cove, 144 st, on May 24. A chartered seine vessel collected nearly 500 herring for AWL analysis during two separate sets in the Southern District this season, one near Glacier Spit and the other off Bear Cove. The Glacier Spit samples were dominated by age-3, -6, and -5 fish (30%, 28%, and 21% respectively), while the Bear Cove samples consisted entirely of age-1 herring.

Outer and Eastern Districts

No aerial surveys of the Outer and Eastern Districts were conducted during the 1999 season. The size of the area and the characteristically poor weather in the Gulf of Alaska, which precludes surveys on a regular basis, makes aerial biomass estimation in these districts impractical. However, incidental observations of herring in June during the early part of the salmon season confirmed the presence of herring in these two districts again this year.

COMMERCIAL FISHERY

Kamishak Bay District

Spotter pilots and fishermen first located and fished the Kamishak Bay District herring populations in 1973, but after several years of significant commercial harvests in the late 1970's herring abundance severely declined and the district was completely closed beginning in 1980.

Herring stocks quickly rebounded in response to the closure. Due in large part to an exceptionally successful 1977 year class, the fishery was reopened in 1985. Since then, the fishery has been regulated to achieve a 10% to 20% exploitation rate mandated by the Alaska Board of Fisheries.

By 1989, fishing efficiency had evolved to a level where intensive regulatory management was required to ensure maximum value of the harvest and maintain the guideline harvest level while protecting younger fish. Management strategy during the 1990's in the Kamishak Bay District stabilized the harvest at an average of 2,300 tons, or just under 40% of the record high catch of 6,132 st set in 1987 (Appendix Tables 32 and 33).

As stated previously, Kamishak Bay District was closed to commercial herring fishing in 1999. The only fish harvested from the district were the aforementioned 100 st taken as cost recovery during the Department's two research/sampling charters. Roe percentage was estimated at approximately 9.1% for the 91 st harvested on May 5 near Chenik Head, while the nine st taken on May 22 in Iniskin Bay were sold as bait. Age-weight-length samples from these harvests were dominated by herring age-6, -5 and -7 (38%, 21%, and 13%, respectively), followed in descending proportional order by age-3, -4, and -11 fish (Table 10).

Southern District

Management strategy for the Southern District sac roe fishery was changed in 1989 to allow for a limited harvest of 150 to 200 st for the purposes of obtaining age, weight, length and roe recovery information. Sac roe herring had not been fished in the Southern District since 1979 when poor stock conditions forced an area-wide closure. Only one other fishery has occurred since that time, when 171 st of herring averaging 8.9% roe recovery were harvested by 10 vessels in a single 2.5-hour opening in Mallard Bay during 1989 (Appendix Table 32). During 1999, Southern District surveys conducted in May failed to document sufficient quantities of herring to warrant an opening.

Outer and Eastern Districts

During the early years of sac roe herring fishing in LCI, seining within the Outer and Eastern Districts primarily occurred in Resurrection Bay. Following a period of suspected over-exploitation, herring stocks throughout LCI generally declined after 1973. Concern over this decline prompted the Alaska Board of Fish and Game in 1974 to establish a 4,000 st quota for all of LCI, with the Outer and Eastern Districts each allocated 1,000 st. The quotas were never utilized since stock abundance continued to decline, and the Outer and Eastern Districts were closed to fishing from 1975 through 1984.

In 1985, the sac roe fishery was allowed to resume in the Outer and Eastern Districts on a very conservative basis, even though no noticeable change in spawning biomass had been observed. Because of the stocks' reduced abundance and extreme vulnerability to fishing, guideline harvest levels were set at 150 to 200 st for each of the four fishing areas created within these two districts. Fishing effort in 1985 was minimal and the majority of the harvest (216 st; Appendix Table 32) once again occurred in Resurrection Bay.

Only limited and sporadic harvests have occurred in these two districts since 1985, with the majority of both the herring harvest and the observed biomass comprised of age-3 and age-4 fish. Unlike the Southern and Kamishak Bay Districts, samples from the Outer and Eastern Districts have contained up to 14% age-2 (sexually immature) herring. Although sampling has been very limited in recent years, no discernible shift to older age herring has ever been observed, suggesting the possibility that the Outer and Eastern Districts may be feeding and rearing grounds for juvenile fish of Prince William Sound origin.

Despite significant opportunity for exploratory fishing on a daily basis in the Outer and Eastern Districts during 1991 and 1992, the predominance of juvenile herring and the history of marginally acceptable roe recoveries from fish caught in these areas has contributed to a lack of interest by fishermen and processors. These conditions prevailed during the years 1993 through 1999 and, consequently, the Outer and Eastern Districts were not opened to purse seining in any of the past seven seasons.

HERRING OUTLOOK AND MANAGEMENT STRATEGY FOR 2000

Kamishak Bay District

Since herring biomass has been declining in Kamishak Bay during recent years and appears to still be below the regulatory threshold of 8,000 tons for which a commercial harvest can occur, the sac roe fishery in the Kamishak Bay district will remain closed for the 2000 season. Current assessment of stock size via the ASA model is 6,330 st (range 4,000 to 11,000 st), and although some indication of recruitment into the spawning population occurred in 1999, the magnitude of this recruitment was questionable. While the 1993 cohort appeared relatively strong at 28% of the forecasted biomass (Table 10, Figure 15), it is estimated to be only one-quarter the size of the very strong 1988 cohort that supported the commercial fishery throughout most of the 1990's. The resource, and hence the commercial fishery, is best served by protecting the remaining spawning population in order to rebuild it to a harvestable level.

The biomass of fish observed in late June during 1999 may be an indication that 1997 produced a strong year class. However, the solitary appearance of this large, nonspawning biomass in McNeil Cove, arriving well after aerial surveys for herring typically end, leaves open the potential that the fish were of non-Kamishak origin. This possibility, coupled with the lack of definitive age-composition samples to represent the biomass, led the staff to exclude this observation from the age-structured model used to forecast the 2000 herring biomass. Should these fish be of Kamishak origin, they will begin recruiting into the spawning population over the next two seasons and their contribution to the overall population will be documented through aerial surveys and age-composition analysis. It also should be noted that this observation was preceded by anecdotal information collected by research vessels targeting other species in LCI during 1998 suggesting relatively high densities of age-1 herring. However, these collective observations cannot be used to reliably predict the length of time necessary to rebuild the herring stocks.

Without a commercial fishery in 2000, the Department's ability to collect age composition information will be greatly reduced. The Department expects to conduct test fishing with a chartered commercial seine vessel throughout the duration of the 2000 run, but available funding may be limited and some volunteer assistance from the commercial fleet could be sought. The Department will also attempt to conduct comprehensive aerial surveys throughout the spawning season, from mid-April to early June, as conditions permit.

Other Districts

Based on recent trends in herring abundance and age structure in the Southern, Outer, and Eastern Districts of LCI, no commercial herring harvests are anticipated in these areas during 2000. Sufficient quantities of herring in the Southern District must be documented before a commercial opening is considered. Monitoring of the Southern District herring stocks will occur as in the past through the use of aerial surveys in conjunction with test fishing samples collected on an opportunistic basis. The Outer and Eastern Districts will only be allowed to open if adequate evidence suggesting commercial quantities of adult herring becomes available. Any potential fishery in these districts will be considered "exploratory" in nature and will be managed accordingly.

COMMERCIAL AQUATIC PLANT HARVEST

For the second consecutive year, a formal request to commercially harvest kelp from Kachemak Bay was received by the Department. Chesloknu Foods, a company owned and operated by Seldovia Village Tribe, once again applied for a permit to take a small quantity of "Bull Kelp" (*Nereocystis leutkeana*) in order to continue marketing a limited amount of select "niche" food products utilizing this kelp species as an ingredient. Consistent with the first year's application, the proposed area of harvest was from kelp beds near the mouth of Fourth of July Creek, just west of Seldovia Bay, with an alternative site off Seldovia Point. These areas support locally large Bull Kelp beds with few other species present.

The request for a total of 500 lbs. (wet weight) was expected to satisfy production requirements. The proposed harvest method was to simply cut and harvest the upper portion of the plant from a skiff. The lower portion would be left attached to the substrate, theoretically allowing the plant to live and continue growing. The proposed harvest time was September 15 to October 15, considerably later than the period used in 1998. Experience from harvesting and marketing efforts last year dictated that a later harvest period would yield a higher quality product yet still satisfy the limited market demand.

After reviewing the proposal, a kelp harvest permit was issued under authority of state regulations regarding aquatic plants (5AAC 37.100). Harvesting was allowed under the terms of an experimental permit, with conditions and restrictions based upon the previous year's harvest, telephone conversations and letters from the applicant, and a very limited literature review, as follows:

- 1) The harvest limit was 500 lbs. wet weight.
- 2) Harvesting would only take place within the Seldovia Subdistrict (241-17) in the Southern District of LCI. Harvest locations would be identified on an appropriate nautical chart, being as specific as possible about the exact location.
- 3) While harvesting, the plants would not be removed from the bottom and care would be taken to keep from straining the plants, which could dislodge the holdfast.
- 4) Detailed harvest records would be maintained showing daily weight of the kelp harvest. These records were to include the number of individual plants harvested for a given wet weight of product. Additionally, fish tickets would be submitted for each sale or shipment of kelp (or kelp product). Fish tickets would be submitted to the Homer area office within seven days of the date of harvest.
- 5) Harvesting was permitted between September 15 and October 15. No harvesting could occur where herring were spawning or where herring eggs were attached to the kelp or surrounding substrate.
- 6) Harvesting would be done by hand from skiffs in random swaths parallel to the beach to minimize disruption of the plants from wave action. The outer fringe

(seaward) plants would be avoided while harvesting to help ensure a navigational aid and provide a wave buffer for the bed.

- 7) Commercial Fisheries management staff in the Homer ADF&G office would be notified prior to beginning the actual harvest and after the final harvest.
- 8) A brief summary report of the project including total harvests, harvest locations, techniques, market interest, and prices would be submitted within 30 days of attaining the harvest limit or by November 15, whichever was earlier.
- 9) All appropriate licensing would be completed with the Commercial Fisheries Entry Commission for vessels and crewmembers.
- 10) It was the responsibility of the applicant to contact other State or Federal agencies regarding other regulations or restrictions that may apply to the proposed operation.

The applicant's final report stated that 170.5 lbs. of Bull Kelp was harvested in two trips: 67 lbs. (30 plants) on October 7 from the area off Fourth of July Creek, and 103.5 lbs. (47 plants) on October 11 from Seldovia Point. An open commercial skiff was used to randomly hand cut individual kelp fronds 2 – 3.5 ft. below the bulb (pneumatocyst), taking care not to pull the holdfast loose.

As with other experimental or developing fisheries, the Department currently has no funding available to develop and manage this new fishery. Therefore, the permit only allowed kelp harvests in two areas of the Seldovia Subdistrict for the 1999 calendar year to meet the stated purpose of manufacturing a very small quantity of specialty kelp products with limited market demand. There was no guarantee that an annual or long-term permit would be issued for the proposed harvest if market demand increased and larger amounts of kelp were subsequently required. It should be noted that the Department had recently determined that no new fisheries would be allowed to develop prior to codification of a statewide Developing Fisheries Policy, scheduled for review by the Alaska Board of Fisheries later in the year. This policy, if adopted, would most certainly affect the proposed commercial kelp harvest in Kachemak Bay.

Because of limited time and funding, no staff time was allocated to monitor this harvest. A cautious management approach was adopted requiring strict accounting of harvest periods, methods, and areas. Until funds become available for surveying harvest areas, estimating annual biomass, and monitoring and examining effects of the harvest on the standing crop, aquatic plant harvest in Kachemak Bay must be regulated on a small-scale experimental basis.

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Table 1. Commercial, hatchery, and derby salmon catches in numbers of fish by species, district, and gear type, Lower Cook Inlet, 1999.

| <i>District</i> | | | | | | |
|------------------------|--------------|----------------|--------------|------------------|--------------|------------------|
| Gear Type | Chinook | Sockeye | Coho | Pink | Chum | Total |
| <i>Southern</i> | | | | | | |
| Commercial: | | | | | | |
| Set gillnet | 1,491 | 27,646 | 1,374 | 5,348 | 4,335 | 40,194 |
| Purse seine | 269 | 198,862 | 1,383 | 242,003 | 289 | 442,806 |
| Hatchery: | | | | | | 0 |
| Purse seine | | 16,276 | | 857,916 | | 874,192 |
| Weir | | 660 | | | | 660 |
| Total | 1,760 | 243,444 | 2,757 | 1,105,267 | 4,624 | 1,357,852 |
| <i>Outer</i> | | | | | | |
| Commercial: | | | | | | |
| Purse seine | 3 | 51,117 | 1,482 | 32,484 | 2,062 | 87,148 |
| <i>Eastern</i> | | | | | | |
| Commercial: | | | | | | |
| Purse seine | 1 | 22,682 | 3 | 1,930 | 1,232 | 25,848 |
| Hatchery: | | | | | | |
| Weir | | 112,623 | 2,502 | | | 115,125 |
| Derby ^a : | | | | | | |
| Hook & Line | | | 1,289 | | | 1,289 |
| Total | 1 | 135,305 | 3,794 | 1,930 | 1,232 | 142,262 |
| <i>Kamishak</i> | | | | | | |
| Commercial: | | | | | | |
| Purse seine | | 29,409 | | 325 | 23 | 29,757 |
| Hatchery: | | | | | | |
| Purse seine | | 17,504 | | 482 | | 17,986 |
| Total | | 46,913 | | 807 | 23 | 47,743 |
| LCI Total | 1,764 | 476,779 | 8,033 | 1,140,488 | 7,941 | 1,635,005 |
| Percent | 0.11% | 29.16% | 0.49% | 69.75% | 0.49% | 100.00% |
| 1979-98 Average | 1,305 | 218,189 | 14,874 | 1,308,818 | 90,393 | 1,633,578 |

^a Derby catches are fish entered into the Seward Silver Salmon Derby which are subsequently sold to a commercial processor, therefore these catches are considered part of the LCI "commercial harvest".

Table 2. Commercial chinook salmon catches, and escapements in numbers of fish by subdistrict, Lower Cook Inlet, 1999.

| Subdistrict/System | Catch | Escapement ^a | Total Run |
|-----------------------------|-------|-------------------------|-----------|
| SOUTHERN DISTRICT | | | |
| Halibut Cove | 825 | | 825 |
| China Poot Bay | 119 | | 119 |
| Neptune Bay | 27 | | 27 |
| Tutka/Kasitsna Bays | 372 | | 372 |
| Barabara Creek | 130 | | 130 |
| Seldovia Bay | 287 | | 287 |
| SOUTHERN DISTRICT TOTAL | 1,760 | | 1,760 |
| OUTER DISTRICT | | | |
| East Arm Nuka Bay | 3 | | 3 |
| OUTER DISTRICT TOTAL | 3 | | 3 |
| EASTERN DISTRICT | | | |
| Resurrection Bay | 1 | | 1 |
| EASTERN DISTRICT TOTAL | 1 | | 1 |
| KAMISHAK BAY DISTRICT TOTAL | 0 | | 0 |
| TOTAL LOWER COOK INLET | 1,764 | | 1,764 |

^a Chinook escapement in Lower Cook Inlet is very limited; no escapement surveys are conducted.

Table 3. Commercial sockeye salmon catches (including hatchery cost recovery) and escapements in numbers of fish by subdistrict, Lower Cook Inlet, 1999.

| Subdistrict/System | Catch | Escapement ^a | Total Run |
|-----------------------------------|---------------------|-------------------------|----------------|
| SOUTHERN DISTRICT | | | |
| Humpy Creek | | 10 | 10 |
| Halibut Cove | 42,920 | | 42,920 |
| China Poot Bay | | | |
| Common Property Fishery | 89,827 | | |
| Hatchery Cost Recovery | 16,139 | | |
| China Poot Creek | | 522 ^b | |
| Total Run | | | 106,488 |
| Neptune Bay | | | |
| Common Property Fishery | 64,597 | | |
| Hatchery Cost Recovery | 49 | | |
| Hazel Lake Creek | | 100 | |
| "Oxbow" Creek | | 15 | |
| Total Run | | | 64,761 |
| Tutka/Kasitsna Bays & Tutka Creek | 18,799 ^c | 98 | 18,897 |
| Barabara Creek | 4,162 | | 4,162 |
| Seldovia Bay | 6,291 | 5 | 6,296 |
| Port Graham | | 1 | 1 |
| English Bay | | | |
| Hatchery Cost Recovery | 660 | | |
| English Bay Lakes | | 14,610 ^d | |
| Hatchery Broodstock | | 1,234 | |
| Total Run | | | 16,504 |
| SOUTHERN DISTRICT TOTAL | 243,444 | 16,595 | 260,039 |
| OUTER DISTRICT | | | |
| Rocky River | | 2 | 2 |
| Port Dick | | | |
| Head End | | 4 | |
| Island Creek | | 2 | |
| Total Run | | | 6 |
| East Arm Nuka Bay (McCarty Fiord) | 51,117 | | |
| Delight Lake | | 17,000 ^e | |
| Desire Lake | | 14,570 | |
| Delusion Lake | | 1,140 | |
| Total Run | | | 83,827 |
| OUTER DISTRICT TOTAL | 51,117 | 32,718 | 83,835 |
| EASTERN DISTRICT | | | |
| Aialik Bay & Aialik Lake | 52 | 3,860 | 3,912 |

-continued-

Table 3. (page 2 of 2)

| Subdistrict/System | Catch | Escapement ^a | Total Run |
|------------------------------------|----------------|-------------------------|----------------|
| EASTERN DISTRICT(cont'd) | | | |
| Resurrection Bay North | | | |
| Common Property Fishery | 22,630 | | |
| Hatchery Cost Recovery | 59,074 | | |
| Hatchery Discards/Donations | 53,549 | | |
| Bear Lake Escapement | | 6,119 ^d | |
| Hatchery Brood Stock | | 1,470 ^f | |
| Bear/Salmon Creeks | | 6,909 | |
| Total Run | | | 149,751 |
| EASTERN DISTRICT TOTAL | 135,305 | 18,358 | 153,663 |
| KAMISHAK BAY DISTRICT | | | |
| Cottonwood Creek | | 10 | 10 |
| Ursus Cove Lagoon Creek | | 1,500 | 1,500 |
| Kirschner Lake | | | |
| Common Property Fishery | 22,256 | | |
| Hatchery Cost Recovery | 17,504 | | |
| Total Run | | | 39,760 |
| Bruin Bay | | | |
| Bruin Lake Creek | | 10 ^b | |
| Bruin Bay River | | 1,020 | |
| Total Run | | | 1,030 |
| Chenik Lake | | | |
| Amakdedori Creek | | 8,800 | |
| Chenik Creek/Lake | | 2,850 | |
| Total Run | | | 11,650 |
| Paint River | | 900 ^g | 900 |
| McNeil Cove (Mikfik Creek/Lake) | 7,153 | 15,717 | 22,870 |
| Kamishak Bay | | | |
| Big Kamishak River | | 500 | |
| Little Kamishak River | | 1,730 | |
| Strike Creek | | 100 | |
| Total Run | | | 2,330 |
| Douglas River/Silver Beach | | | |
| Douglas Clearwater Tributary | | 280 | |
| Douglas Reef Main Left | | 85 | |
| Total Run | | | 365 |
| KAMISHAK BAY DISTRICT TOTAL | 46,913 | 33,502 | 80,415 |
| TOTAL LOWER COOK INLET | 476,779 | 101,173 | 577,952 |

^a Escapement estimates derived from limited aerial surveys. Numbers represent unexpanded aerial live counts.

^b No freshwater escapement, prevented by barrier falls.

^c Commercial catch includes 88 sockeyes harvested incidentally during pink salmon hatchery cost recovery.

^d Weir counts.

^e Weir counts and video images.

^f Brood stock total at Bear Lake includes 286 mortalities.

^g No freshwater escapement, ladder not opened during 1999.

Table 4. Commercial coho salmon catches (including hatchery cost recovery and sport derby sold to commercial processors) and escapements in numbers of fish by subdistrict, Lower Cook Inlet, 1999.

| Subdistrict/System | Catch | Escapement ^a | Total Run |
|------------------------------------|--------------|-------------------------|---------------|
| SOUTHERN DISTRICT | | | |
| Northshore Subd./Clearwater Slough | | 650 | 650 |
| Halibut Cove | 494 | | 494 |
| China Poot Bay | 357 | | 357 |
| Neptune Bay | 597 | | 597 |
| Tutka/Kasitsna Bays | 822 | | 822 |
| Barabara Creek | 381 | | 381 |
| Seldovia Bay | 106 | | 106 |
| SOUTHERN DISTRICT TOTAL | 2,757 | 650 | 3,407 |
| OUTER DISTRICT | | | |
| East Arm Nuka Bay (McCarty Fiord) | 1,482 | | 1,482 |
| OUTER DISTRICT TOTAL | 1,482 | | 1,482 |
| EASTERN DISTRICT | | | |
| Aialik Bay | 3 | | 3 |
| Resurrection Bay North | | | |
| Hatchery Cost Recovery | 2,028 | | |
| Hatchery Discards/Donations | 474 | | |
| Sport Derby | 1,289 | | |
| Bear Lake (weir counts) | | 391 ^b | |
| Hatchery Brood Stock | | 939 | |
| Total Run | | | 5,121 |
| EASTERN DISTRICT TOTAL | 3,794 | 1,330 | 5,124 |
| KAMISHAK BAY DISTRICT TOTAL | 0 | | 0 |
| TOTAL LOWER COOK INLET | 8,033 | 1,980 | 10,013 |

^a Coho escapement estimates in Lower Cook Inlet are very limited; two escapement surveys were conducted during 1999, number represents unexpanded aerial live count.

^b Escapement total includes 23 cohos estimated downstream of the weir.

Table 5. Commercial pink salmon catches (including hatchery cost recovery) and escapements in numbers of fish by subdistrict, Lower Cook Inlet, 1999.

| Subdistrict/System | Catch | Escapement ^a | Total Run |
|--------------------------------|--------------------|-------------------------|------------------|
| SOUTHERN DISTRICT | | | |
| Humpy Creek | | 12,827 | 12,827 |
| Halibut Cove | 3,373 | | 3,373 |
| China Poot Bay/Creek | 6,273 ^b | 685 | 6,958 |
| Neptune Bay | 13,345 | | 13,345 |
| Tutka/Kasitsna Bays | | | |
| Common Property Fishery | 222,228 | | |
| Hatchery Cost Recovery | 857,902 | | |
| Hatchery Brood Stock | | 151,903 | |
| Tutka Lagoon Creek | | 27,947 | |
| Total Run | | | 1,259,980 |
| Barabara Creek | 683 | 3,922 | 4,605 |
| Seldovia Bay & River | 1,463 | 12,159 | 13,622 |
| Port Graham | | | |
| Hatchery Brood Stock | | 0 | |
| Port Graham River | | 9,651 | |
| Total Run | | | 9,651 |
| English Bay | | 18,796 ^c | 18,796 |
| SOUTHERN DISTRICT TOTAL | 1,105,267 | 237,890 | 1,343,157 |
| OUTER DISTRICT | | | |
| Dogfish Bay | | 12,376 | 12,376 |
| Port Chatham | | 10,697 | 10,697 |
| Chugach Bay | | 6,429 | 6,429 |
| Windy Bay | | | |
| Windy Right Creek | | 5,159 | 5,159 |
| Windy Left Creek | | 24,020 | 24,020 |
| Total Run | | | |
| Rocky Bay | | | |
| Scurvy Creek | | 900 | 900 |
| Rocky River | | 17,164 | 17,164 |
| Total Run | | | |
| Port Dick | | | |
| Port Dick (head end) Creek | | 8,328 | |
| High Tech Creek | | 127 | |
| Well Flagged Creek | | 84 | |
| Slide Creek | | 711 | |
| Middle Creek | | 1,259 | |
| Island Creek | | 8,566 | |
| Total Run | | | 19,075 |
| Taylor Bay | | 4,469 | 4,469 |

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Table 5. (page 2 of 3)

| Subdistrict/System | Catch | Escapement ^a | Total Run |
|-----------------------------------|--------|-------------------------|-----------|
| OUTER DISTRICT (cont'd) | | | |
| Port Dick (Outer) | | | |
| Sunday Harbor | | 2,103 | |
| Takoma Cove | | 526 | |
| Total Run | | | 2,629 |
| Tonsina Bay | | 2,234 | 2,234 |
| Petrof River | | 500 | 500 |
| Nuka Island | | | |
| South Nuka Island Creek | | 2,400 | |
| Mike's Bay | | 3,463 | |
| Home Cove | | 1,577 | |
| Herring Pete Bay | | 1,051 | |
| Total Run | | | 8,491 |
| East Arm Nuka Bay (McCarty Fiord) | 32,484 | | |
| Delight Lake | | 461 | |
| Desire Lake | | 6,832 | |
| Delusion Lake | | 571 | |
| Total Run | | | 40,348 |
| OUTER DISTRICT TOTAL | 32,484 | 122,007 | 154,491 |
| EASTERN DISTRICT | | | |
| Aialik Bay | 1,930 | 915 | 2,845 |
| Resurrection Bay North | | | |
| Bear/Salmon Creeks | | 7,769 | |
| Sawmill Creek | | 156 | |
| Spring Creek | | 391 | |
| Tonsina Creek | | 492 | |
| Humpy Cove | | 3,960 | |
| Thumb Cove/Likes Creek | | 9,180 ^d | |
| Total Run | | | 21,948 |
| EASTERN DISTRICT TOTAL | 1,930 | 22,863 | 24,793 |
| KAMISHAK BAY DISTRICT | | | |
| Inisksin Bay | | | |
| North Head Creek | | 603 | |
| Sugarloaf Creek | | 200 | |
| Total Run | | | 803 |
| Cottonwood Bay/Creek | | 200 | 200 |
| Ursus Cove | | | |
| Brown's Peak Creek | | 2,630 | |
| Ursus Lagoon Righthand Cr. | | 100 | |
| Ursus Lagoon Creek | | 2,700 | |
| Total Run | | | 5,430 |

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Table 5. (page 3 of 3)

| Subdistrict/System | Catch | Escapement ^a | Total Run |
|------------------------------------|------------------|-------------------------|------------------|
| KAMISHAK BAY DISTRICT (cont'd) | | | |
| Rocky Cove/Sunday Creek | | 5,310 | 5,310 |
| Kirschner Lake | 807 ^c | | 807 |
| Bruin Bay | | | |
| Bruin Bay River | | 2,882 | |
| Bruin Lake Creek | | 25 | |
| | | | 2,907 |
| Kamishak Reef | | | |
| Big Kamishak River | | 5,657 | |
| Little Kamishak River | | 4,229 | |
| Strike Creek | | 629 | |
| Total Run | | | 10,515 |
| Douglas Reef/Silver Beach | | | |
| Douglas Reef | | 531 | |
| Douglas Reef Main Left | | 452 | |
| Douglas Reef | | 531 | |
| | | | 1,514 |
| KAMISHAK BAY DISTRICT TOTAL | 807 | 26,679 | 27,486 |
| TOTAL LOWER COOK INLET | 1,140,488 | 409,439 | 1,549,927 |

^a Escapement estimates are derived from periodic ground or aerial surveys with stream life factors applied.

^b China Poot catches include 14 pinks caught during hatchery sockeye salmon cost recovery harvests.

^c English Bay River pink escapement total includes 1,270 fish taken under special permit issued to Port Graham Hatchery Corporation for brood stock purposes.

^d Escapement figure for Likes Creek (Thumb Cove) includes 70 pinks removed under special permit for brood stock purposes by the Alaska Sea Life Center.

^e Kirschner Lake pinks include 325 taken during common property fishing and 482 taken during hatchery sockeye cost recovery harvests.

Table 6. Commercial chum salmon catches and escapements in numbers of fish by subdistrict, Lower Cook Inlet, 1999.

| Subdistrict/System | Catch | Escapement ^a | Total Run |
|--------------------------------|--------------|-------------------------|---------------|
| SOUTHERN DISTRICT | | | |
| Humpy Creek | | 607 | 607 |
| Halibut Cove | 92 | | 92 |
| China Poot Bay | 88 | | 88 |
| Neptune Bay | 65 | | 65 |
| Tutka Bay | 1,485 | 4 | 1,489 |
| Barabara Creek | 1,386 | | 1,386 |
| Seldovia Bay & River | 1,508 | 4,021 | 5,529 |
| Port Graham & River | | 6,595 | 6,595 |
| SOUTHERN DISTRICT TOTAL | 4,624 | 11,227 | 15,851 |
| OUTER DISTRICT | | | |
| Dogfish Bay | | 18,799 | 18,799 |
| Port Chatham | | 1,100 | 1,100 |
| Windy Bay | | | |
| Windy Right Creek | | 362 | |
| Windy Left Creek | | 716 | |
| Total Run | | | 1,078 |
| Rocky Bay & River | | 5,383 | 5,383 |
| Port Dick | | | |
| Port Dick (head end) Creek | | 2,874 | |
| High Tech Creek | | 10 | |
| Slide Creek | | 1,958 | |
| Middle Creek | | 215 | |
| Island Creek | | 16,398 | |
| Total Run | | | 21,455 |
| Nuka Island/Petrof River | | 1,000 | 1,000 |
| East Arm Nuka Bay/James Lagoon | 2,062 | 217 | 2,279 |
| OUTER DISTRICT TOTAL | 2,062 | 49,032 | 51,094 |
| EASTERN DISTRICT | | | |
| Aialik Bay | 1,232 | | 1,232 |
| Resurrection Bay North | | | |
| Sawmill Creek | | 244 | |
| Spring Creek | | 333 | |
| Thumb Cove | | 74 | |
| Tonsina Creek | | 2,465 | |
| Total Run | | | 3,116 |
| EASTERN DISTRICT TOTAL | 1,232 | 3,116 | 4,348 |

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Table 6. (page 2 of 2)

| Subdistrict/System | Catch | Escapement ^a | Total Run |
|------------------------------------|--------------|-------------------------|----------------|
| KAMISHAK BAY DISTRICT | | | |
| Iniskin Bay | | | |
| Iniskin River | | 23,257 | |
| Sugarioaf Creek | | 1,383 | |
| North Head Creek | | 903 | |
| Total Run | | | 25,543 |
| Cottonwood Bay & Creek | | 11,993 | 11,993 |
| Ursus Cove | | | |
| Brown's Peak Creek | | 1,250 | |
| Ursus Lagoon Right Creek | | 9,264 | |
| Ursus Cove Lagoon Creek | | 11,764 | |
| Total Run | | | 22,278 |
| Rocky Cove/Sunday Creek | | 3,700 | 3,700 |
| Kirschner Lake | 23 | | 23 |
| Bruin Bay & River | | 10,302 | 10,302 |
| McNeill River | | 13,509 | 13,509 |
| Kamishak/Douglas Reef | | | |
| Big Kamishak River | | 11,578 | |
| Little Kamishak River | | 8,897 | |
| Strike Creek | | 1,506 | |
| Douglas Reef Creek | | 782 | |
| Douglas Reef Main Left Cr. | | 1,107 | |
| Total Run | | | 23,870 |
| Douglas River/Douglas Beach Creek | | 3,579 | 3,579 |
| KAMISHAK BAY DISTRICT TOTAL | 23 | 114,774 | 114,797 |
| TOTAL LOWER COOK INLET | 7,941 | 178,149 | 186,090 |

^a Escapement estimates are derived from periodic ground or aerial surveys with stream life factors applied.

Table 7. Exvessel value^a of the commercial salmon catch in numbers of dollars by species, gear type, and harvest type, Lower Cook Inlet, 1999.

| | Chinook | Sockeye | Coho | Pink | Chum | Total |
|--|----------|--------------------------|-----------------------|-----------|----------|-------------|
| COMMON PROPERTY - PURSE SEINE | | | | | | |
| No. of Fish | 273 | 302,070 | 2,868 | 276,742 | 3,606 | 585,559 |
| Pounds | 2,767 | 1,466,562 | 17,140 | 756,085 | 29,789 | 2,272,343 |
| Price/lb. | \$1.00 | \$1.27 | \$0.38 | \$0.12 | \$0.20 | |
| Value | \$2,767 | \$1,862,534 | \$6,513 | \$90,730 | \$5,958 | \$1,968,502 |
| COMMON PROPERTY - SET GILLNET | | | | | | |
| No. of Fish | 1,491 | 27,646 | 1,374 | 5,348 | 4,335 | 40,194 |
| Pounds | 23,344 | 147,027 | 7,751 | 18,359 | 33,115 | 229,596 |
| Price/lb. | \$2.07 | \$1.66 | \$0.70 | \$0.16 | \$0.43 | |
| Value | \$48,322 | \$244,065 | \$5,426 | \$2,937 | \$14,239 | \$314,989 |
| HATCHERY - PURSE SEINE & WEIR | | | | | | |
| No. of Fish | | 147,063 | 2,502 | 858,398 | | 1,007,963 |
| Pounds | | 606,688 | 16,469 | 2,091,222 | | 2,714,379 |
| Price/lb. | | \$1.14 ^b | \$0.24 ^b | \$0.18 | | |
| Value | | \$352,576 ^b | \$3,354 ^b | \$376,420 | | \$732,350 |
| SPORT FISHING DERBY^c - HOOK & LINE | | | | | | |
| No. of Fish | | | 1,289 | | | 1,289 |
| Pounds | | | 11,607 | | | 11,607 |
| Price/lb. | | | \$0.65 | | | |
| Value | | | \$7,545 | | | \$7,545 |
| TOTAL ALL GEARS | | | | | | |
| No. of Fish | 1,764 | 476,779 | 8,033 | 1,140,488 | 7,941 | 1,635,005 |
| Pounds | 26,111 | 2,220,277 | 52,967 | 2,865,666 | 62,904 | 5,227,925 |
| Price/lb. | \$1.96 | \$1.22 ^b | \$0.45 ^b | \$0.16 | \$0.32 | |
| Value | \$51,089 | \$2,459,175 ^b | \$22,838 ^b | \$470,087 | \$20,197 | \$3,023,386 |

^a Exvessel value is calculated from average prices, which are determined only by fish ticket information and may not reflect retroactive or postseason adjustments.

^b Average price and value for sockeyes and cohos include only those fish actually sold and does not include hatchery fish that were donated or discarded.

^c Fish entered into the Seward Silver Salmon Derby are subsequently sold to a commercial processor and are therefore considered "commercial harvest".

Table 8. Emergency orders issued for the commercial, personal use, and subsistence salmon and herring fisheries in Lower Cook Inlet, 1999.

| Number/ Issue Date | DESCRIPTION |
|-------------------------|---|
| 2-F-H-001-99 May 14 | <p>Opens those waters of Resurrection Bay in the Eastern District enclosed by a line from Aialik Cape south to a point one mile due south of Aialik Cape, then northeast to a point one mile due south of Cape Resurrection, then north to Cape Resurrection, to commercial salmon seining on a weekly schedule of five days per week, from Monday 6:00 a.m. until Friday 10:00 p.m., effective Monday, May 17, 1999, until further notice. All waters along the west shore of Resurrection Bay west of a line from the old military dock pilings north of Caines Head to a regulatory marker near the Seward Airport will remain closed to seining.</p> |
| 2-F-H-002-99 May 27 | <p>Closes the Port Graham Subdistrict, including the English Bay Section, in the Southern District to commercial salmon set gillnet fishing until further notice.</p> <p>In addition, this emergency order establishes a seven-day-per-week fishing schedule in the Kamishak Bay District commercial salmon seine fishery, which opens by regulation on June 1, 1999. The Chenik and Paint River Subdistricts within the Kamishak Bay District will remain closed to commercial salmon seining until further notice based on the provisions of this emergency order.</p> |
| 2-F-H-003-99 June 16 | <p>Designates and establishes Special Harvest Areas (SHA's) for Cook Inlet Aquaculture Association (CIAA) in Paint River, Bruin Bay, and China Poot Subdistricts of the Lower Cook Inlet (LCI) management area. It also designates and establishes an English Bay SHA for the Port Graham Hatchery Corporation (PGHC) in the English Bay Section of Port Graham Subdistrict, located in the Southern District of the LCI management area. This emergency order closes the Kirschner and Bruin Lakes SHA's to the common property salmon seine fishery, while concurrently opening waters of the Kirschner Lake, Bruin Lake, and Paint River SHA's in the Kamishak Bay District, and the China Poot and Hazel Lake SHA's in the Southern District, to the harvest of salmon seven days per week by authorized agents of CIAA effective at 6:00 a.m. Monday, June 21, 1999, until further notice. The English Bay SHA will remain closed to hatchery fishing until the escapement goal of 15,000 sockeyes into English Bay Lakes can be projected and the sockeye salmon subsistence needs of Nanwalek and Port Graham villagers are met.</p> <p>This emergency order also opens portions of the China Poot, Tutka Bay, and Halibut Cove Subdistricts, all within the Southern District, to commercial salmon seining five days per week, from Monday 6:00 a.m. until Saturday 6:00 a.m., effective 6:00 a.m. Monday, June 21, 1999, until further notice. In the China Poot Subdistrict, commercial seining shall be allowed five days per week only in those waters outside (offshore) of a line beginning at a marker on the west shore of Neptune Bay at approximately 59° 32' 50" N. latitude, 151° 24' 57" W.</p> |

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Table 8. (page 2 of 4)

| Number/ Issue Date | DESCRIPTION |
|--|---|
| 2-F-H-003-99 June 16 (continued) | <p>longitude, then to Lancashire Rock, then to the navigational light on Gull Island, then to Moosehead Point, effective June 21. In the Halibut Cove Subdistrict, seining shall be allowed only in waters outside of Halibut Cove Lagoon beginning June 21 on a five days per week basis. In the Tutka Bay Subdistrict, commercial seining is restricted to those waters seaward of a line extending from the "rock quarry" on the north side of the bay at approximately 59° 30' 14" N. latitude, 151° 28' 14" W. longitude, to the Tutka Bay Lodge on the south side of the bay at approximately 59° 28' 31" N. latitude, 151° 28' 55" W. longitude, five days per week effective 6:00 a.m. Monday, June 21, 1999.</p> <p>This emergency order also repeals the regulatory closed waters markers in China Poot Bay, and establishes temporary closed waters at the head of China Poot Bay to provide a Dungeness crab sanctuary.</p> |
| 2-F-H-004-99 June 16 | <p>Designates and establishes a Special Harvest Area (SHA) for the Cook Inlet Aquaculture Association (CIAA) in Tutka Bay Subdistrict within the Southern District of Lower Cook Inlet. The Tutka Bay SHA consists of all marine waters of Tutka Bay Subdistrict southeast of the Homer Electric Association powerline crossing, including waters of Tutka Lagoon. This emergency order also designates and establishes a SHA for the Port Graham Hatchery Corporation (PGHC) along the southern shore of Port Graham in Port Graham Subdistrict within the Southern District of Lower Cook Inlet.</p> <p>In addition, this emergency order opens the Tutka Bay SHA to the harvest and sale of salmon seven days per week by authorized agents of CIAA, effective at 6:00 a.m. Monday, June 21, 1999, until further notice. Revenue obtained from the sale of these fish will be used for recovery of operational expenses associated with the Tutka Lagoon Hatchery salmon enhancement programs in Lower Cook Inlet.</p> <p>The commercial purse seine fishery in the Tutka Bay Subdistrict is currently restricted to those waters seaward of a line extending from the "rock quarry" on the north side of Tutka Bay at approximately 59° 30' 14" N. latitude, 151° 28' 14" W. longitude, to the Tutka Bay Lodge on the south side of the bay at approximately 59° 28' 31" N. latitude, 151° 28' 55" W. longitude, on a five days per week basis. Waters of Tutka Bay between the HEA powerlines and the above-described line remain closed to all seine fishing.</p> |
| 2-F-H-005-99 June 23 | <p>Opens waters inside McNeil River Lagoon in the Kamishak Bay District to commercial salmon seining for a two-hour period, from 12:00 noon until 2:00 p.m., on Thursday, June 24, 1999.</p> |

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Table 8. (page 3 of 4)

| Number/ Issue Date | DESCRIPTION |
|-------------------------|--|
| 2-F-H-006-99 June 28 | Opens a portion of East Nuka Subdistrict in the Outer District to commercial salmon seining five days per week, from Monday 6:00 a.m. until Saturday 6:00 a.m., effective 12:00 noon Tuesday, June 29, 1999, until further notice. Fishing in East Nuka Bay is restricted to those waters between the latitude of the entrance to James Lagoon at approximately 59° 33' 30" N. latitude and the regulatory markers at approximately 59° 37' 30" N. latitude. Waters south of the entrance to James Lagoon, as well as waters north of the regulatory markers by the Parks Service former tent camp, remain closed to fishing. Traditional closed waters markers near the mouth of Desire Lake Creek will be in effect for this opening. |
| 2-F-H-007-99 July 1 | Extends fishing time for commercial set gillnets in Halibut Cove Subdistrict of the Southern District to five days per week, from 6:00 a.m. Monday until 6:00 a.m. Saturday, effective at 6:00 a.m. Monday, July 5, 1999, until further notice. |
| 2-F-H-008-99 July 13 | Opens waters of East Nuka Subdistrict in the Outer District to commercial salmon seining five days per week, from Monday 6:00 a.m. until Saturday 6:00 a.m., effective at 12:00 noon Wednesday, July 14, until further notice. The closed waters markers at the mouths of Desire Lake Creek and Delight Lake Creek WILL NOT BE in effect for this opening, and fishing will be allowed up to both creek mouths. In addition, seining will be allowed inside waters of McCarty Lagoon near Delight Lake. |
| 2-F-H-009-99 July 18 | Closes waters of the China Poot and Hazel Lakes Special Harvest Areas (see <i>LCI E.O. #2-F-H-003-99</i>) in the Southern District to salmon hatchery cost recovery harvest by Cook Inlet Aquaculture Association effective at 12:00 noon Sunday, July 18, 1999. In addition, this emergency order opens waters of China Poot Subdistrict, including both the China Poot and Hazel Lake Sections, to commercial salmon seining west (or offshore) of the regulatory markers located near the HEA power lines in China Poot Bay on a seven-day-per-week basis , effective at 6:00 a.m. Monday, July 19, until further notice. Waters of China Poot Bay east (or inshore) of these markers will open to commercial seining five days per week , from Monday 6:00 a.m. until Saturday 6:00 a.m., also effective at 6:00 a.m. Monday, July 19, until further notice. The regulatory markers designating the Dungeness crab sanctuary in the north arm of China Poot Bay are still in effect for these openings. At China Poot Creek, the regulatory markers near the creek mouth will be in effect during the Monday through Saturday opening. At Neptune Bay, no markers will be in effect and fishing is allowed up to the Wosnesenski River mouth. |

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Table 8. (page 4 of 4)

| Number/ Issue Date | DESCRIPTION |
|--|---|
| 2-F-H-009-99 July 18 (continued) | In addition, this emergency order opens waters of Aialik Subdistrict, including Aialik Lagoon, in the Eastern District to commercial salmon seining five days per week, from Monday 6:00 a.m. until Saturday 6:00 a.m., effective at 6:00 a.m. Monday, July 19, until further notice. |
| 2-F-H-010-99 July 20 | <p>Opens the English Bay SHA (see <i>LCI Emergency Order #2-F-H-003-99</i>) to the harvest of salmon for purposes of hatchery cost recovery seven days per week by authorized agents of Port Graham Hatchery Corporation effective at 12:00 noon Tuesday, July 20, 1999, until further notice.</p> <p>In the Southern District, the English Bay SHA consists of all waters of English Bay River beginning at (and including) the adult sockeye salmon counting weir site operated by Chugach Regional Resources Commission (CRRC) to a point approximately 300 yards downstream of this site. The English Bay SHA is defined as those waters of English Bay River between 59° 20' 32" N. latitude and 59° 20' 53" N. latitude.</p> |
| 2-F-H-011-99 August 1 | <p>Closes the Kirschner and Bruin Lakes Special Harvest Areas (SHA's; see <i>LCI Emergency Order #2-F-H-003-99</i>) to the harvest of salmon by authorized agents of Cook Inlet Aquaculture Association (CIAA) effective at 6:00 a.m., Monday, August 2, 1999, until further notice. Concurrently, this emergency order opens all waters of Bruin Bay Subdistrict to commercial salmon seining seven days per week until further notice.</p> <p>This emergency order also closes waters of McNeil River Subdistrict in Kamishak Bay District to commercial salmon seining effective at 6:00 a.m. Monday, August 2, 1999, until further notice.</p> |
| 2-F-H-012-99 August 6 | Closes the Tutka Bay Special Harvest Area (see <i>LCI E.O. # 2-F-H-004-99</i>), except for waters of Tutka Lagoon, to the harvest of salmon by authorized agents of Cook Inlet Aquaculture Association (CIAA), effective at 6:00 a.m. Saturday, August 7, 1999, until further notice. Concurrently, waters of Tutka Bay Subdistrict, excluding Tutka Lagoon, will open to commercial salmon seining seven days per week until further notice. Waters of Tutka Lagoon will remain open to hatchery fishing and closed to commercial seining. |
| 2-F-H-013-99 August 25 | Closes the Southern District (Kachemak Bay) personal use set gillnet fishery for coho salmon, effective at 6:00 a.m. Saturday, August 28, 1999, for the remainder of the season. |

Table 9. Total return of adult pink salmon to the Tutka Bay Hatchery in the Southern District of Lower Cook Inlet, 1999.

| <u>COMMERCIAL HARVEST</u> | |
|--|---------------------------------|
| Tutka Bay/Lagoon: | |
| Purse Seine | 219,160 |
| Set Gillnet | 3,068 ^a |
| Hatchery Cost Recovery | <u>857,902</u> |
| <i>TUTKA COMMERCIAL HARVEST</i> | <i>1,080,130</i> |
| | |
| <u>SPORT HARVEST</u> | |
| <i>TOTAL SPORT HARVEST (Tutka Bay and Lagoon)</i> | <i>2,000^b</i> |
| | |
| <u>ESCAPEMENT</u> | |
| Tutka Creek and Channel | 27,947 |
| Tutka Hatchery Brood Stock | <u>151,903</u> |
| <i>TOTAL ESCAPEMENT</i> | <i>179,850</i> |
| | |
| <i>TOTAL RETURN</i> | <i>1,261,980</i> |

^a Based primarily on run timing, all of the set gillnet pink salmon catch in the Tutka Bay Subdistrict was apportioned to the Tutka Hatchery return.

^b Figure represents average estimated sport catch of pinks in Tutka Bay from 1990 – 1997.

Table 10. Total biomass estimates and commercial catch of Pacific herring (*Clupea pallasii*) in short tons by age class, Kamishak Bay District, Lower Cook Inlet, 1999, and 2000 forecast^a.

| Age | 1999 Est. Spawning Biomass | Percent by Weight | 1999 Commercial Harvest ^b | Percent by Weight | 1999 Total Biomass | Percent by Weight | 2000 Forecast Biomass | Percent by Weight |
|--------|----------------------------|-------------------|--------------------------------------|-------------------|--------------------|-------------------|-----------------------|-------------------|
| 1 | | | | | | | | |
| 2 | | | | | | | | |
| 3 | 651 | 11.50 | 8 | 7.85 | 659 | 11.44 | 388 | 6.13 |
| 4 | 563 | 9.93 | 7 | 6.85 | 569 | 9.88 | 1,100 | 17.37 |
| 5 | 1,265 | 22.34 | 21 | 21.15 | 1,287 | 22.32 | 667 | 10.54 |
| 6 | 1,839 | 32.47 | 39 | 38.23 | 1,877 | 32.57 | 1,282 | 20.25 |
| 7 | 729 | 12.88 | 13 | 12.91 | 742 | 12.88 | 1,751 | 27.66 |
| 8 | 226 | 3.99 | 3 | 3.28 | 229 | 3.98 | 551 | 8.70 |
| 9 | 195 | 3.44 | 3 | 2.98 | 198 | 3.43 | 139 | 2.20 |
| 10 | 123 | 2.17 | 2 | 1.69 | 124 | 2.16 | 131 | 2.07 |
| 11 | 60 | 1.06 | 5 | 4.57 | 65 | 1.12 | 79 | 1.25 |
| 12 | 11 | 0.19 | <1 | 0.40 | 11 | 0.19 | 221 | 3.49 |
| 13+ | 1 | 0.02 | <1 | 0.10 | 1 | 0.02 | 22 | 0.35 |
| TOTALS | 5,662 | 100.00 | 101 | 100.00 | 5,763 | 100.00 | 6,331 | 100.00 |

^a Absence of reliable aerial survey data in 1999 dictated use of the ASA model's "hindcast" estimate to derive the 1999 spawning biomass (see text). Additionally, because of the ASA Model's inability to produce a point estimate with certainty due to recent years' limited aerial survey data, the spawning, total run, and forecast biomass estimates presented here represent the midpoint of possible biomass estimates.

^b Due to the low forecasted biomass, the commercial herring fishery in Kamishak Bay was not opened in 1999. The published harvest occurred during ADF&G research and sampling charters.

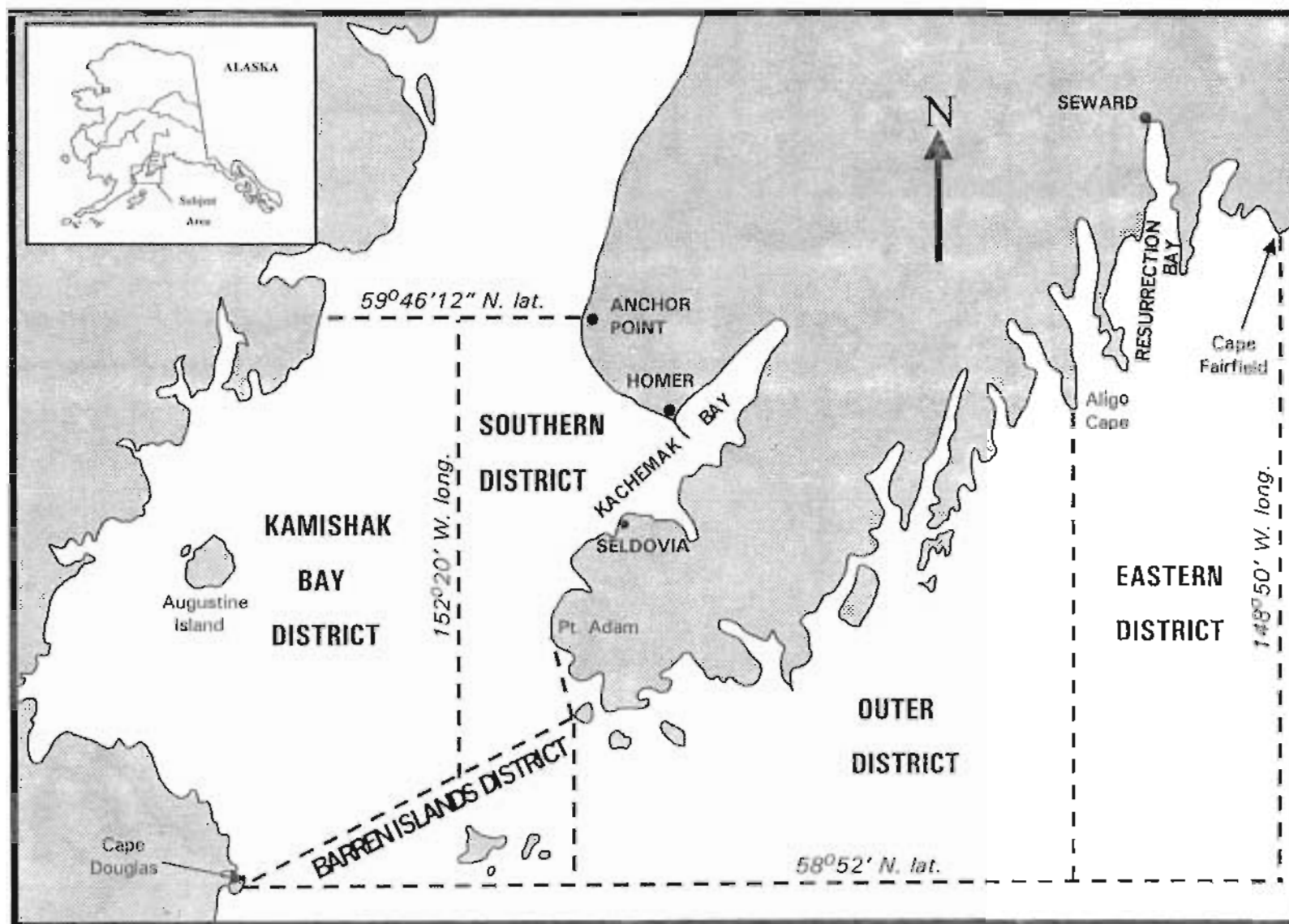


Figure 1. Lower Cook Inlet salmon and herring management area (not to scale).

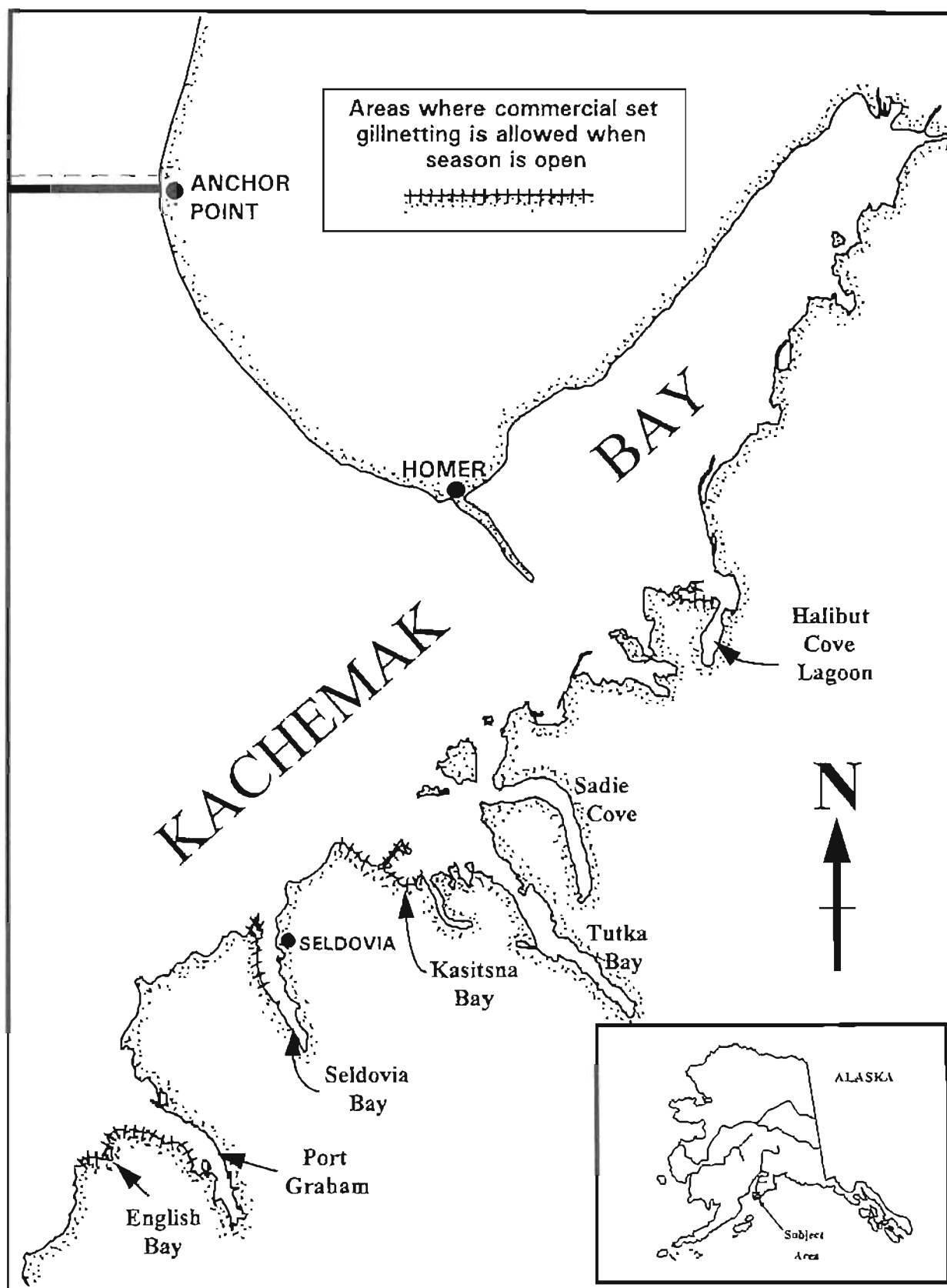


Figure 2. Commercial set gillnet locations in the Southern District of Lower Cook Inlet.

SOUTHERN DISTRICT SPECIAL HARVEST AREAS

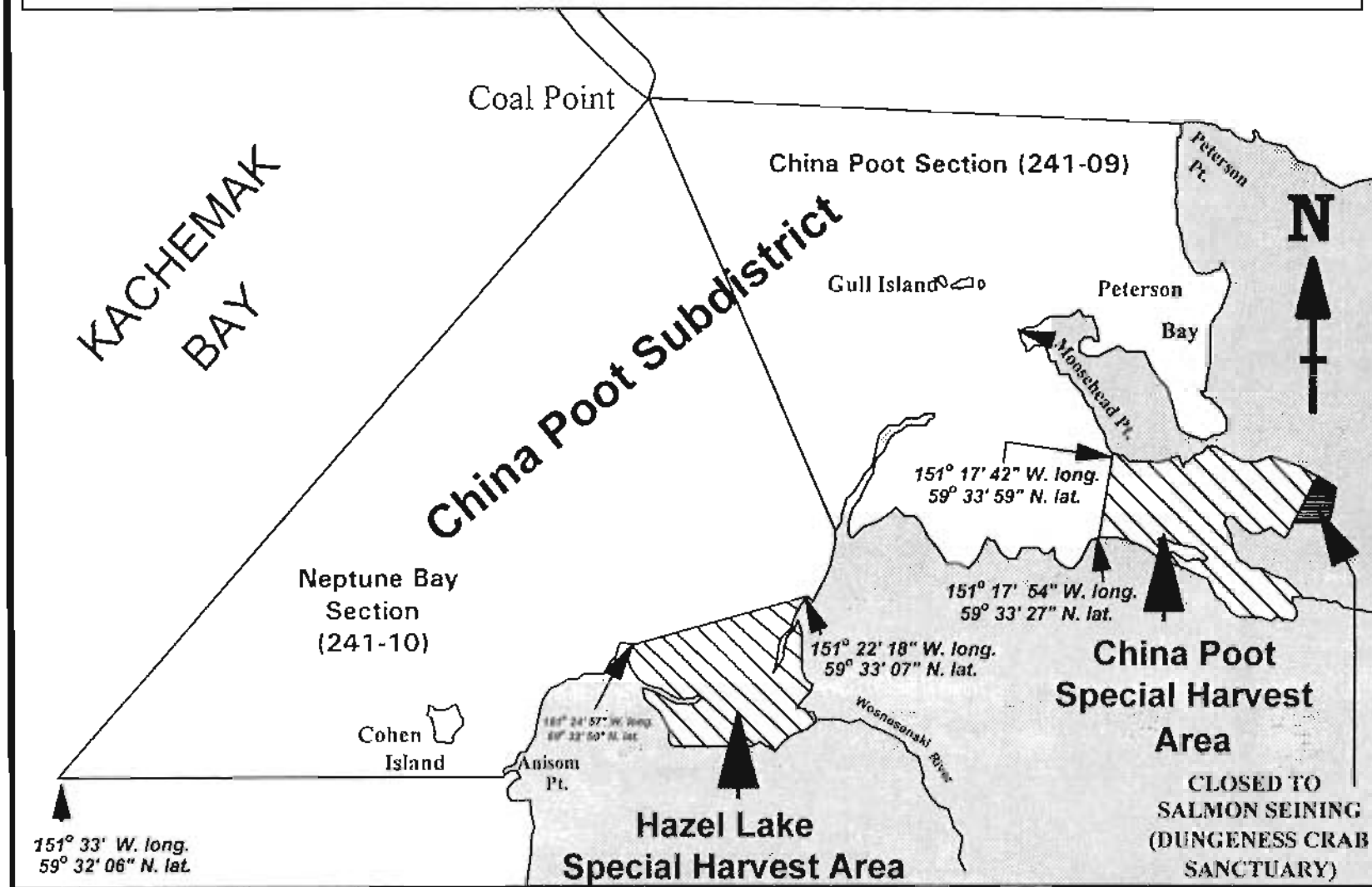


Figure 3. China Poot and Hazel Lake Special Harvest Areas for salmon hatchery cost recovery in the Southern District of Lower Cook Inlet.

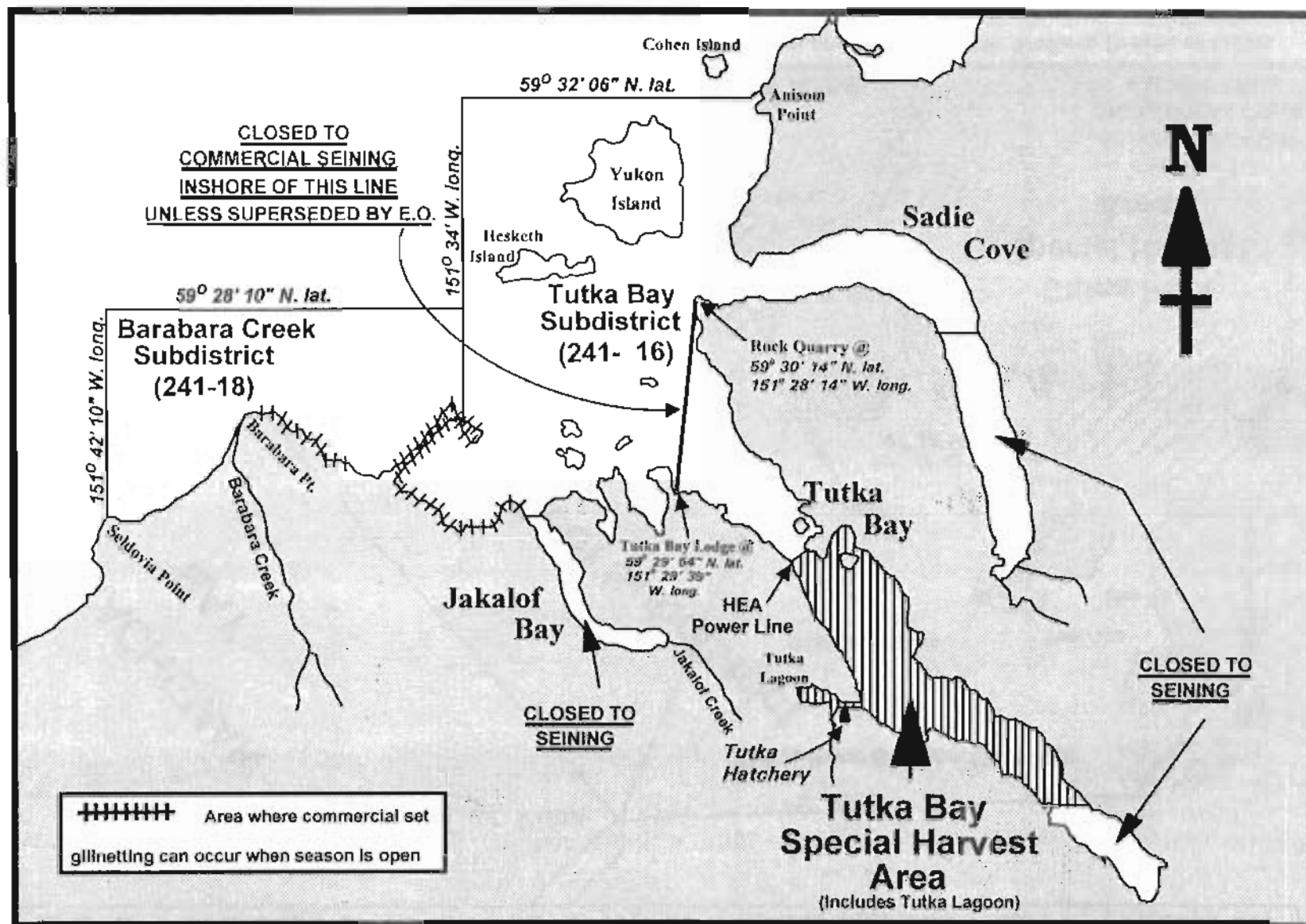


Figure 4. Tutka Special Harvest Area for salmon hatchery cost recovery in the Southern District of Lower Cook Inlet.

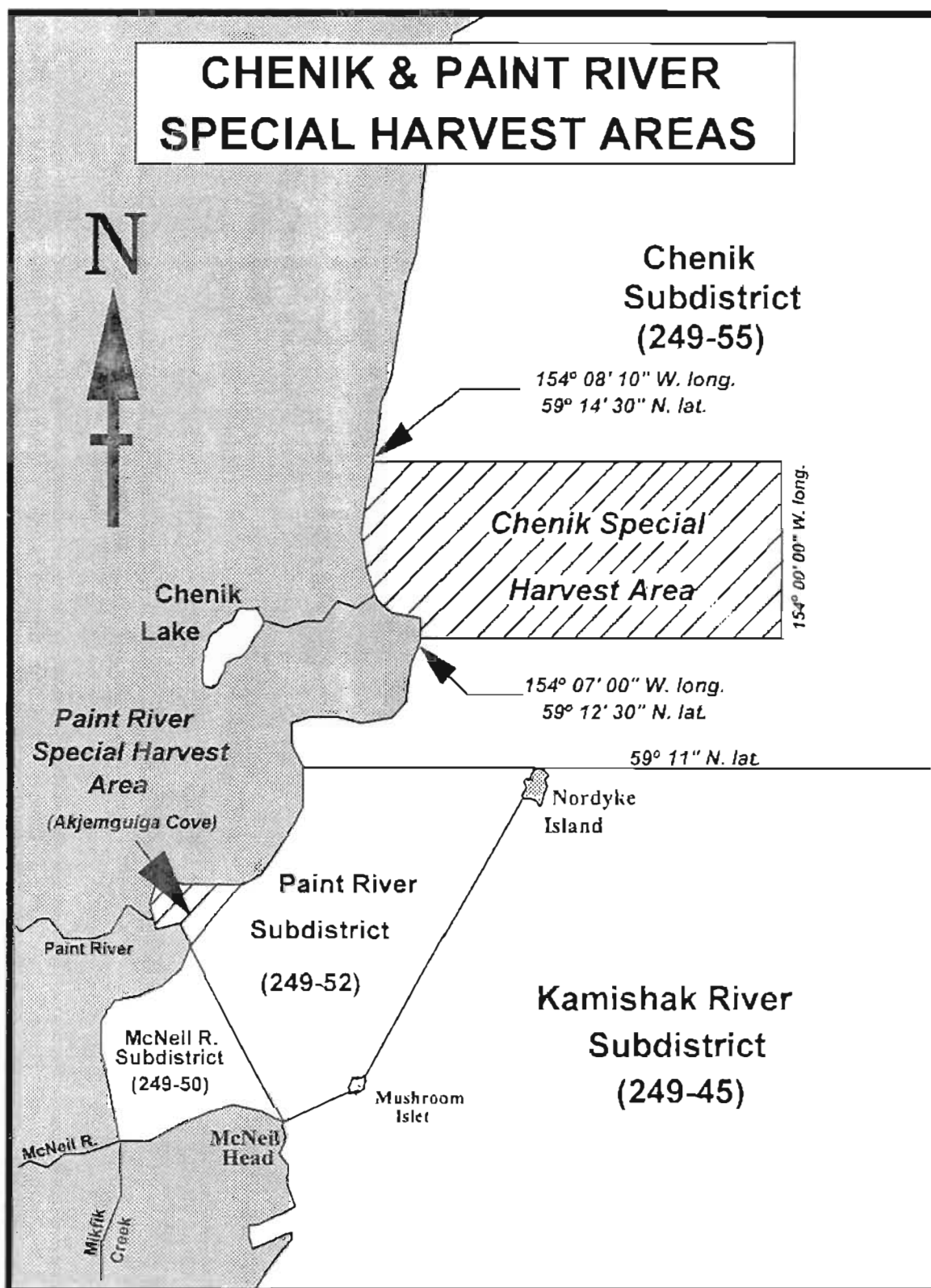


Figure 5. Chenik and Paint River Special Harvest Areas for salmon hatchery cost recovery in the Kamishak Bay District of Lower Cook Inlet.

KIRSCHNER & BRUIN LAKES SPECIAL HARVEST AREAS



Note: Regulations prohibit salmon net fishing in federal waters beyond territorial seas (3 nautical miles).

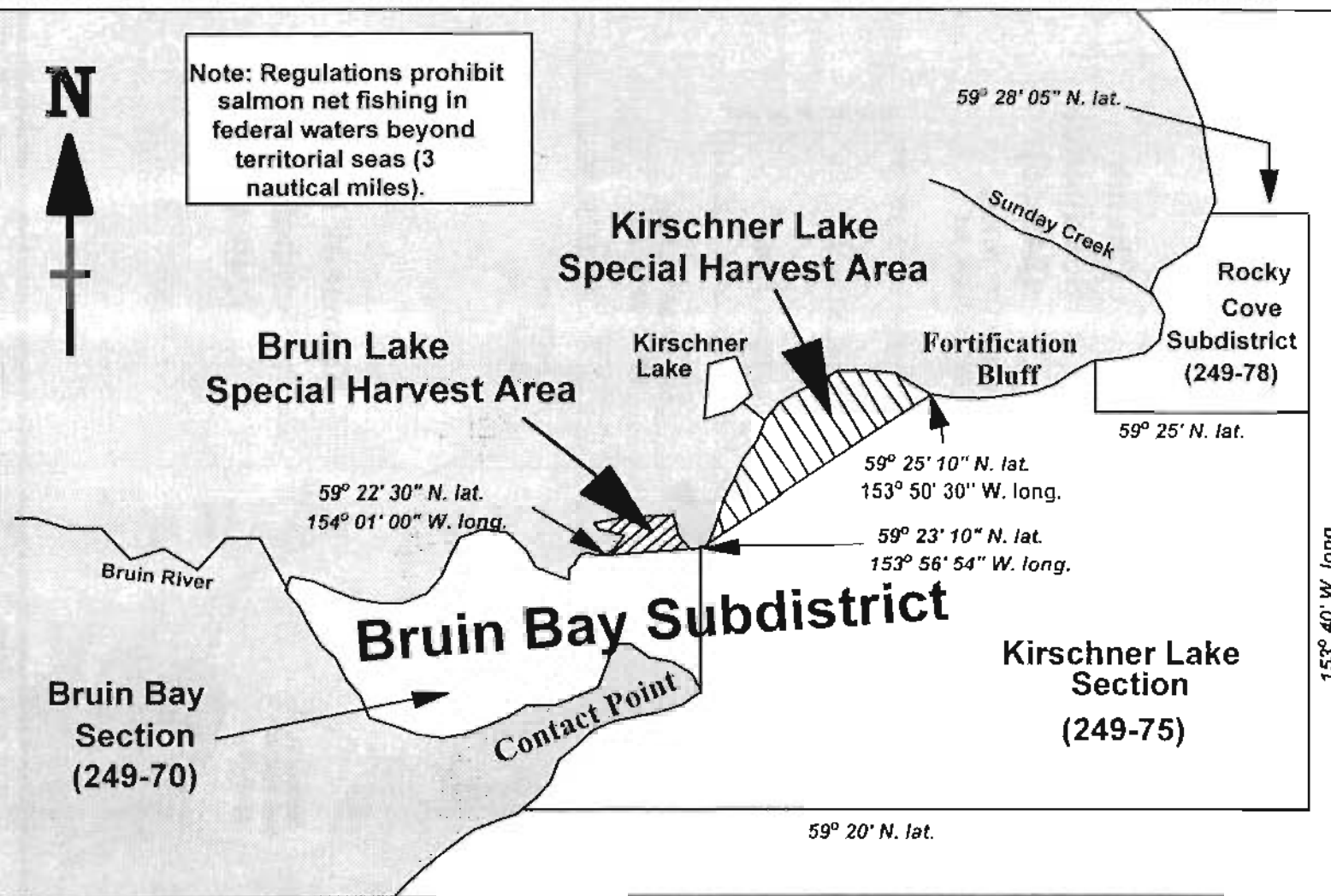


Figure 6. Kirschner and Bruin Lakes Special Harvest Areas for salmon hatchery cost recovery in the Kamishak Bay District of Lower Cook Inlet.

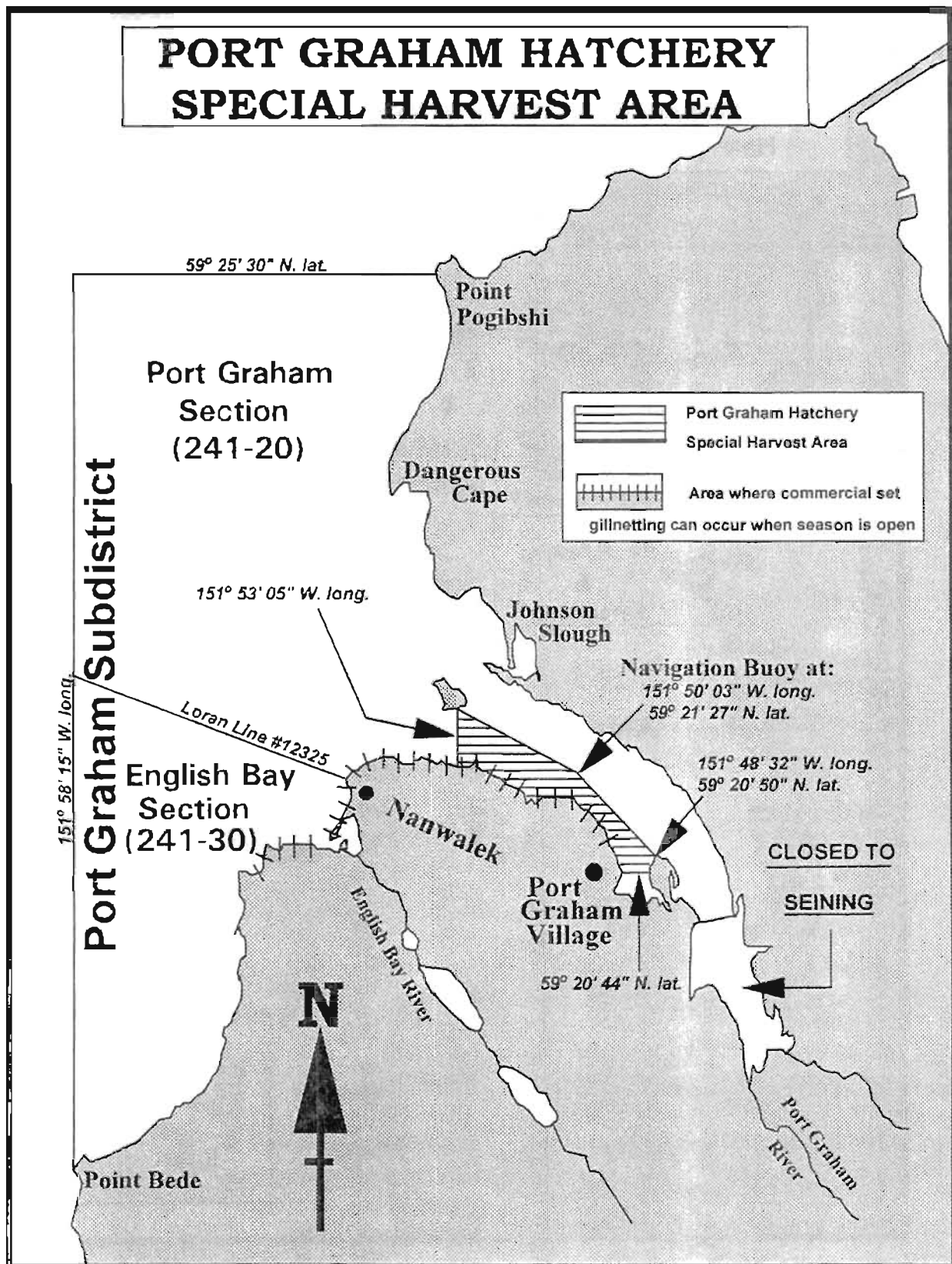


Figure 7. Port Graham Special Harvest Area for salmon hatchery cost recovery in the Southern District of Lower Cook Inlet.

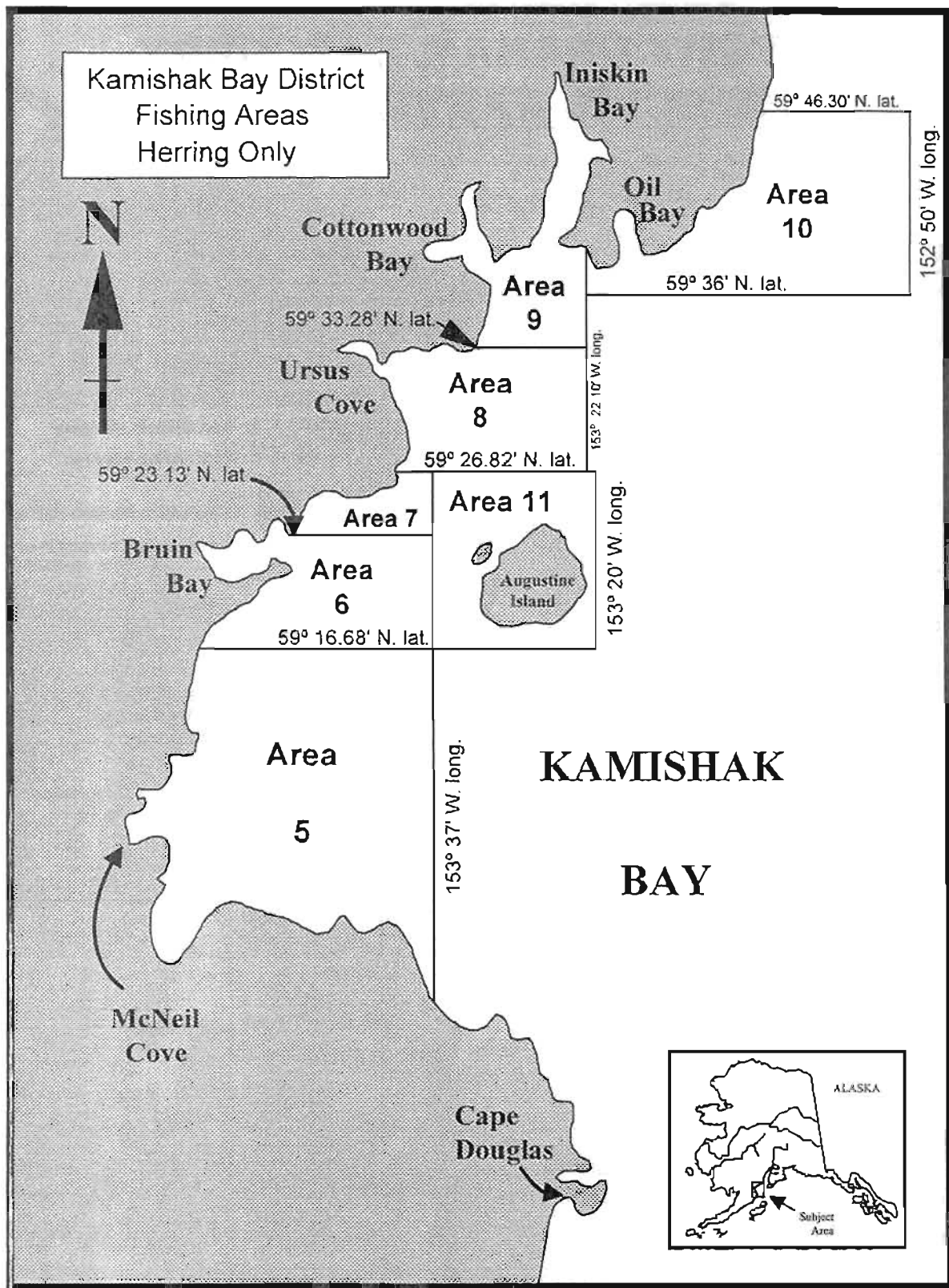


Figure 8. Commercial herring fishing areas in the Kamishak Bay District of Lower Cook Inlet.

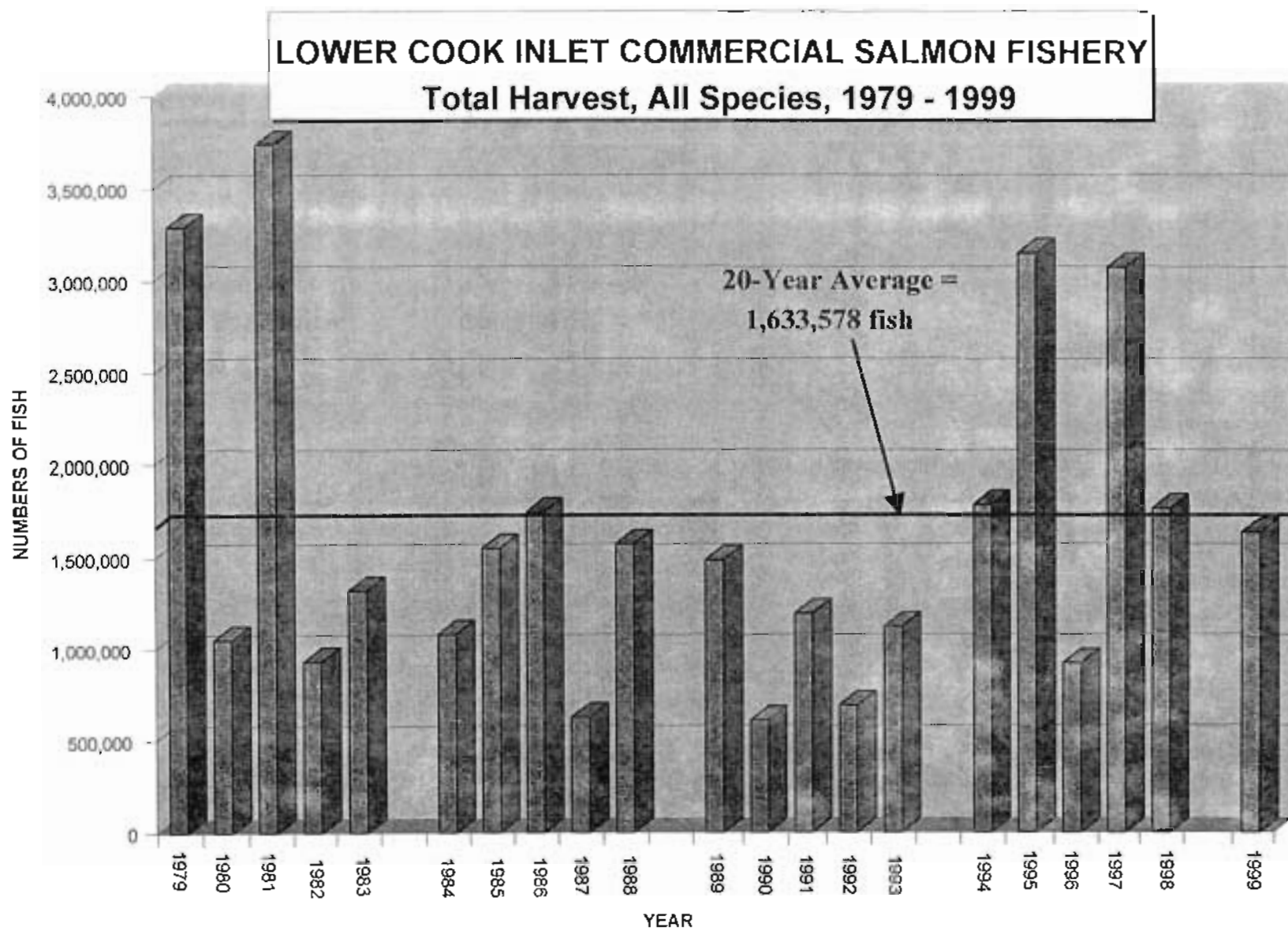


Figure 9. Total commercial salmon catch, Lower Cook Inlet, 1979 - 1999.

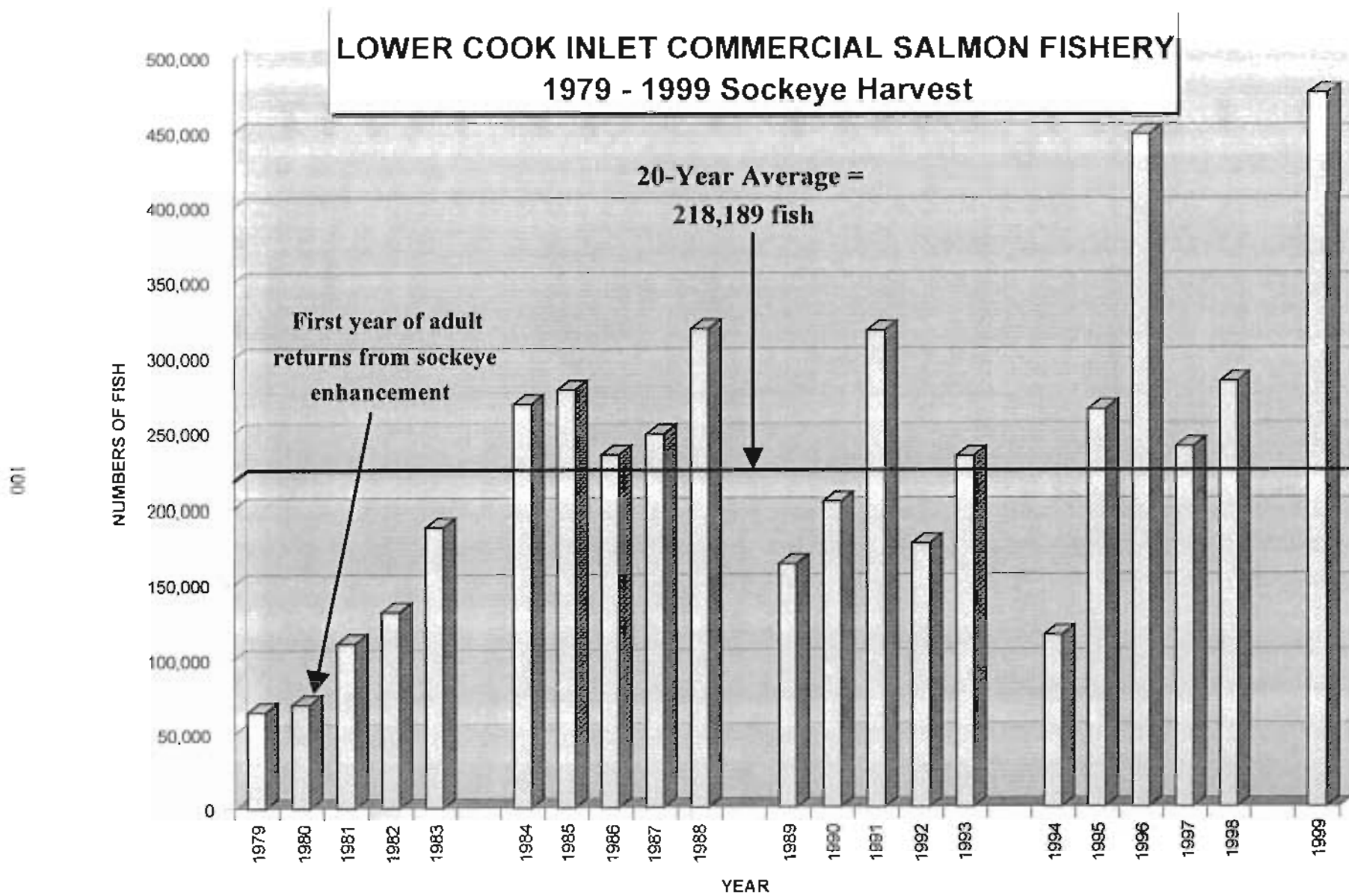


Figure 10. Commercial sockeye salmon catch, Lower Cook Inlet, 1979 - 1999.

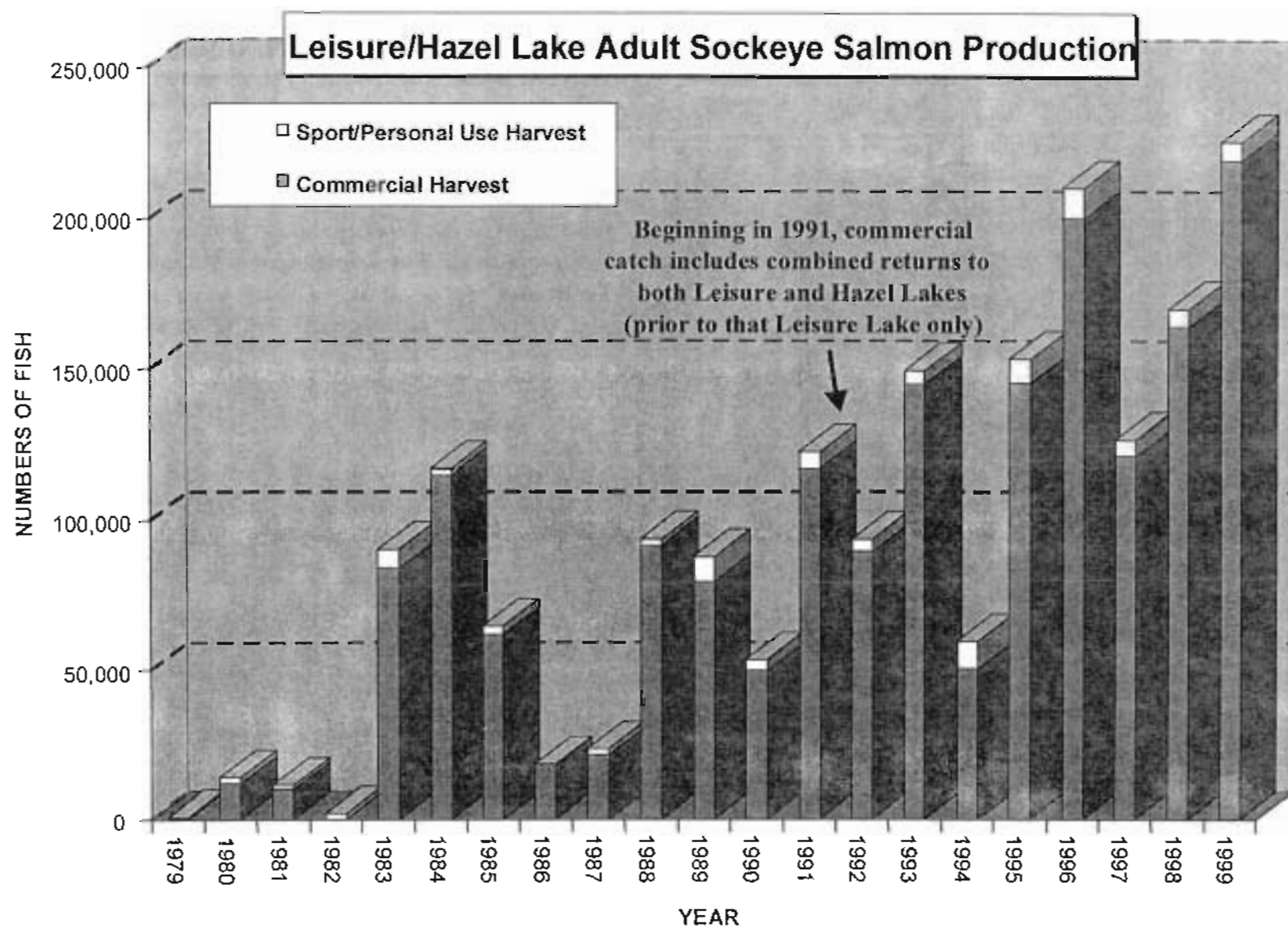


Figure 11. Sockeye salmon returns to Leisure and Hazel Lakes in the Southern District of Lower Cook Inlet, 1980 - 1999.

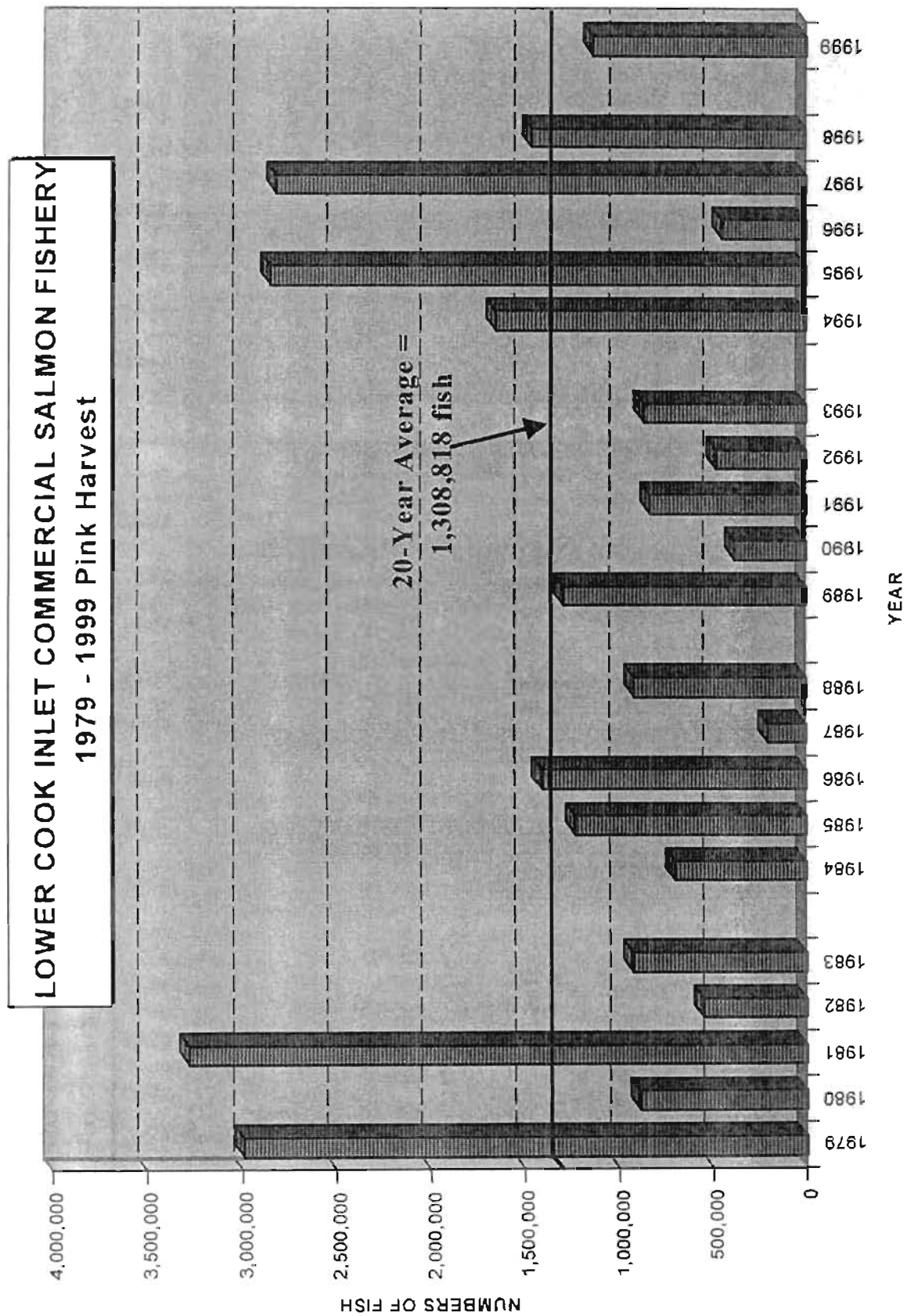


Figure 12. Commercial pink salmon catch, Lower Cook Inlet, 1979 - 1999.

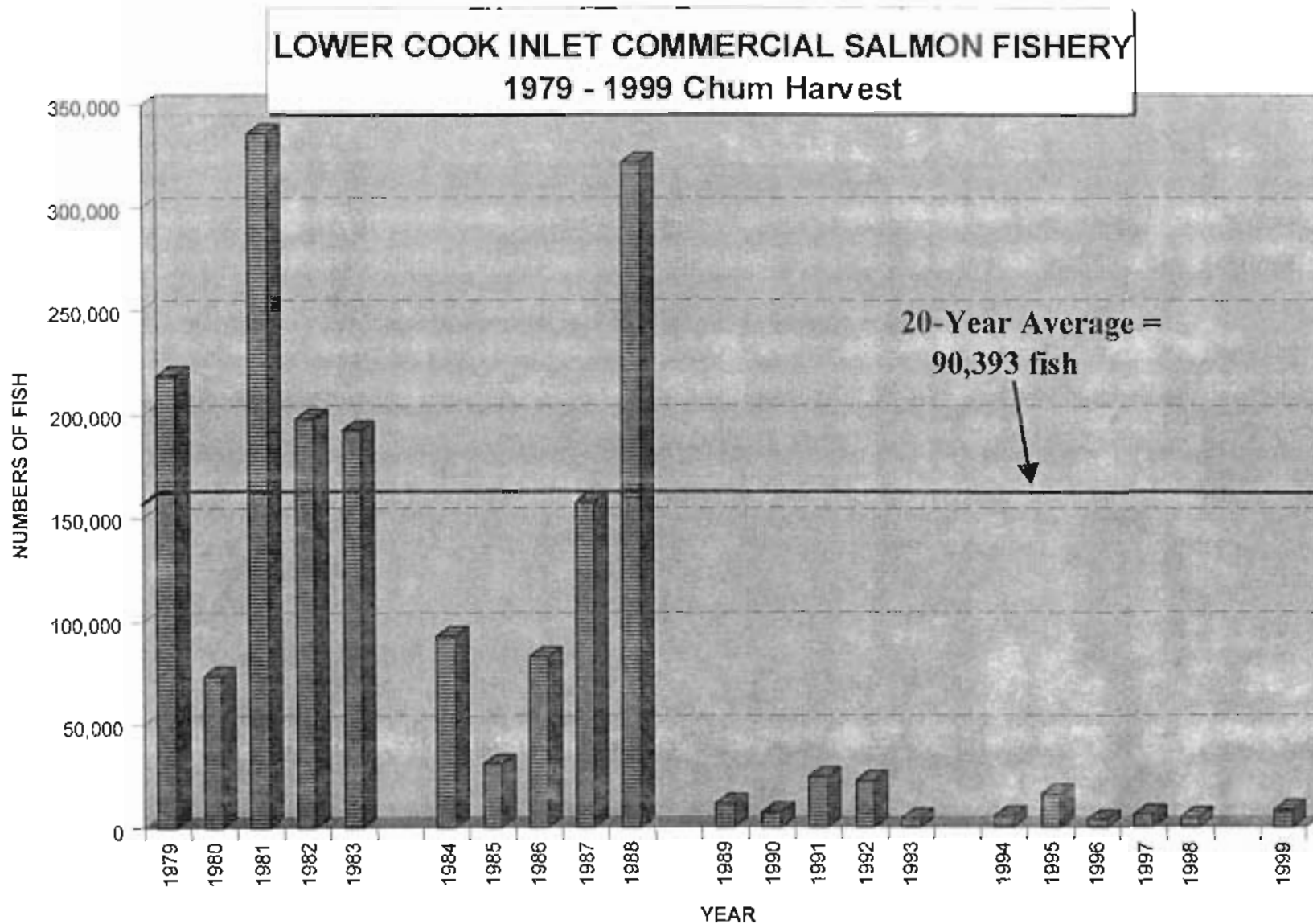


Figure 13. Commercial chum salmon catch, Lower Cook Inlet, 1979 - 1999.

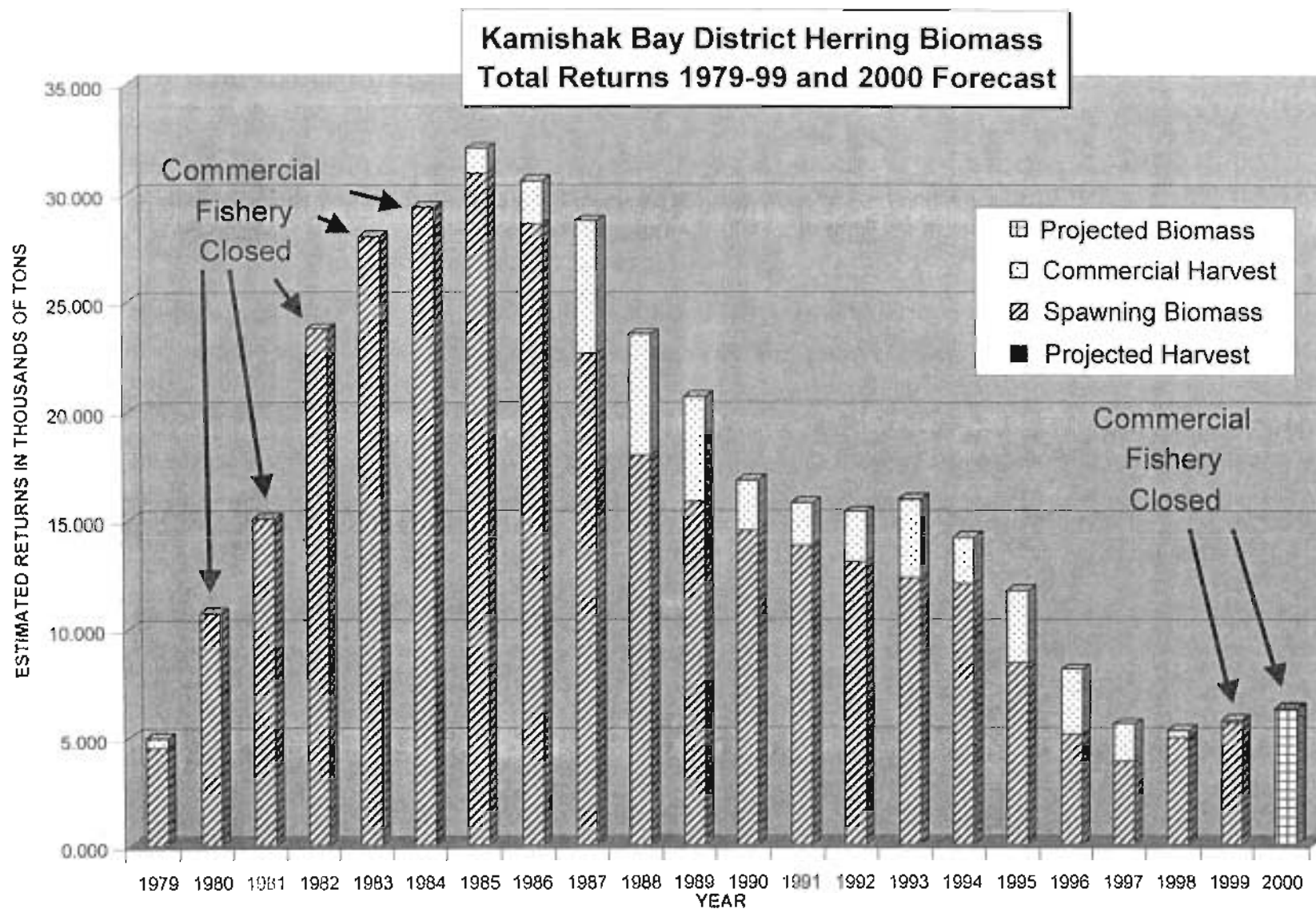


Figure 14. Biomass estimates and commercial harvests of Pacific herring in the sac roe seine fishery, Kamishak Bay, District, Lower Cook Inlet, 1979 - 1999, and 2000 projection.

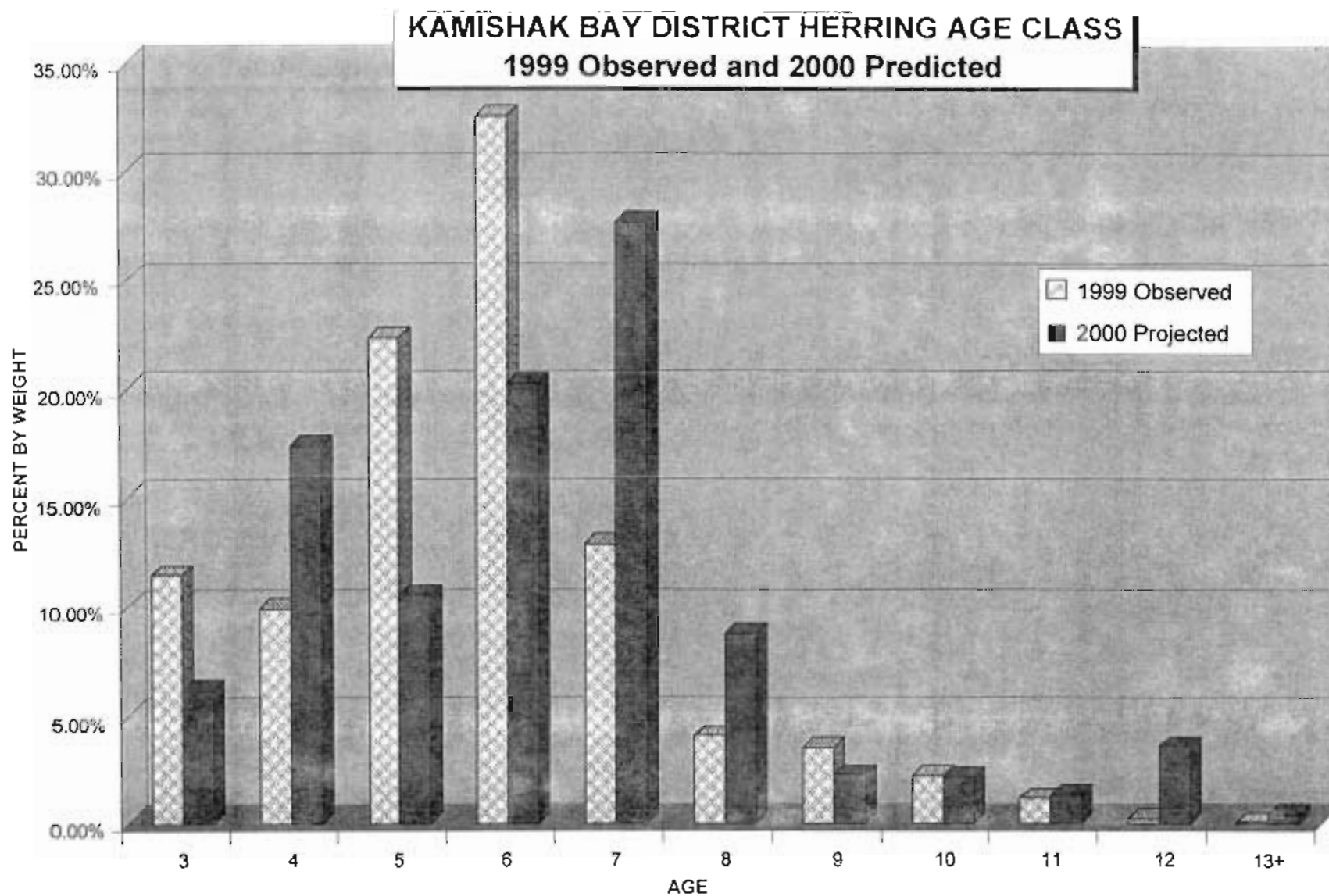


Figure 15. Herring age composition from samples collected in Kamishak Bay District, Lower Cook Inlet, 1999, and 2000 forecast.

Appendix Table 1. Salmon fishing permits issued and fished, by gear type, Lower Cook Inlet, 1979 - 1999^a.

| Year | Seines | | | Actively fished | Set Net Permits fished |
|--------------|-------------------|-----------------|--------------|-----------------|------------------------|
| | Permanent Permits | Interim Permits | Total Issued | | |
| 1979 | 75 | 9 | 84 | 75 | 38 |
| 1980 | 75 | 9 | 84 | 83 | 40 |
| 1981 | 75 | 10 | 85 | 85 | 40 |
| 1982 | 77 | 7 | 84 | 69 | 39 |
| 1983 | 78 | 5 | 83 | 83 | 24 |
| 1984 | 78 | 3 | 81 | 54 | 35 |
| 1985 | 80 | 1 | 81 | 51 | 34 |
| 1986 | 79 | 0 | 79 | 62 | 34 |
| 1987 | 79 | 0 | 79 | 66 | 29 |
| 1988 | 79 | 0 | 79 | 71 | 27 |
| 1989 | 83 | 0 | 83 | 64 | 23 |
| 1990 | 82 | 1 | 83 | 71 | 20 |
| 1991 | 82 | 1 | 83 | 68 | 20 |
| 1992 | 82 | 1 | 83 | 63 | 21 |
| 1993 | 82 | 1 | 83 | 51 | 17 |
| 1994 | 82 | 1 | 83 | 32 | 16 |
| 1995 | 83 | 1 | 84 | 49 | 23 |
| 1996 | 84 | 1 | 85 | 34 | 24 |
| 1997 | 84 | 1 | 85 | 23 | 25 |
| 1998 | 84 | 1 | 85 | 41 | 24 |
| 1999 | 84 | 1 | 85 | 45 | 20 |
| 1979-98 Avg. | 80 | 3 | 83 | 60 | 28 |
| 1989-98 Avg. | 83 | 1 | 84 | 50 | 21 |

^a Data source: Commercial Fisheries Entry Commission and ADF&G fish ticket database.

Appendix Table 2. Exvessel value of the commercial salmon harvest in thousands of dollars by species, Lower Cook Inlet, 1979 - 1999^a.

| Year | Chinook | Sockeye | Coho | Pink | Chum | Total |
|-------------------|---------|---------|-------|--------|-------|---------|
| 1979 | 36 | 621 | 68 | 4,495 | 1,097 | 6,317 |
| 1980 | 12 | 336 | 64 | 1,196 | 298 | 1,906 |
| 1981 | 18 | 740 | 69 | 5,334 | 1,346 | 7,507 |
| 1982 | 28 | 827 | 367 | 406 | 820 | 2,448 |
| 1983 | 20 | 704 | 57 | 696 | 513 | 1,990 |
| 1984 | 23 | 1,393 | 120 | 635 | 242 | 2,413 |
| 1985 | 47 | 1,637 | 86 | 974 | 78 | 2,822 |
| 1986 | 21 | 1,414 | 132 | 1,245 | 201 | 3,013 |
| 1987 | 27 | 1,951 | 118 | 295 | 598 | 2,989 |
| 1988 | 32 | 3,812 | 127 | 2,237 | 2,548 | 8,756 |
| 1989 | 33 | 1,213 | 59 | 1,660 | 39 | 3,004 |
| 1990 | 29 | 1,287 | 28 | 306 | 31 | 1,681 |
| 1991 ^b | 19 | 1,115 | 36 | 275 | 48 | 1,493 |
| 1992 ^b | 30 | 1,152 | 19 | 212 | 53 | 1,466 |
| 1993 ^b | 27 | 802 | 41 | 287 | 7 | 1,164 |
| 1994 ^b | 18 | 496 | 93 | 745 | 9 | 1,361 |
| 1995 ^b | 48 | 1,381 | 62 | 1,245 | 24 | 2,760 |
| 1996 ^b | 26 | 2,113 | 42 | 100 | 5 | 2,286 |
| 1997 ^b | 23 | 1,066 | 36 | 1,286 | 10 | 2,421 |
| 1998 ^b | 20 | 1,224 | 37 | 712 | 9 | 2,002 |
| 1999 ^b | 51 | 2,459 | 23 | 470 | 20 | 3,023 |
| 1979-98 Avg. | 27 | 1,279 | 84 | 1,200 | 415 | 3,005 |
| 1999 % of Total | 1.69% | 81.34% | 0.76% | 15.55% | 0.66% | 100.00% |

^a Values obtained by using the formula: (average price per lb.) x (average weight per fish) x (catch) = Exvessel value; average prices are determined only from fish ticket information and may not reflect retroactive or postseason adjustments.

^b Includes hatchery cost recovery.

Appendix Table 3. Average salmon price in dollars per pound by species, Lower Cook Inlet, 1979 - 1999^a.

| Year | Chinook | Sockeye | Coho | Pink | Chum |
|--------------|---------|-------------------|-------------------|------|------|
| 1979 | 1.54 | 1.53 | 0.89 | 0.43 | 0.60 |
| 1980 | 1.30 | 0.88 | 0.85 | 0.42 | 0.52 |
| 1981 | 1.35 | 1.10 | 0.75 | 0.44 | 0.49 |
| 1982 | 1.29 | 1.05 | 0.87 | 0.23 | 0.46 |
| 1983 | 1.00 | 0.75 | 0.70 | 0.25 | 0.29 |
| 1984 | 1.29 | 1.05 | 0.77 | 0.26 | 0.28 |
| 1985 | 1.60 | 1.25 | 0.85 | 0.22 | 0.31 |
| 1986 | 1.25 | 1.40 | 0.85 | 0.26 | 0.30 |
| 1987 | 1.25 | 1.60 | 1.00 | 0.42 | 0.46 |
| 1988 | 1.25 | 2.50 | 1.80 | 0.80 | 0.84 |
| 1989 | 1.25 | 1.60 | 0.70 | 0.40 | 0.40 |
| 1990 | 1.35 | 1.55 | 0.60 | 0.30 | 0.50 |
| 1991 | 1.12 | 0.83 | 0.29 | 0.13 | 0.27 |
| 1992 | 1.29 | 1.47 | 0.43 | 0.14 | 0.27 |
| 1993 | 1.02 | 0.80 | 0.51 | 0.12 | 0.28 |
| 1994 | 0.95 | 1.06 | 0.62 | 0.15 | 0.25 |
| 1995 | 1.17 | 1.11 | 0.47 | 0.15 | 0.24 |
| 1996 | 1.33 | 0.91 | 0.40 | 0.08 | 0.18 |
| 1997 | 1.29 | 0.93 ^b | 0.50 ^b | 0.15 | 0.23 |
| 1998 | 1.45 | 0.96 ^b | 0.36 ^b | 0.16 | 0.27 |
| 1999 | 1.96 | 1.22 ^b | 0.45 ^b | 0.16 | 0.32 |
| 20-Year Avg. | 1.27 | 1.23 | 0.74 | 0.28 | 0.39 |
| 1979-88 Avg. | 1.31 | 1.31 | 0.93 | 0.37 | 0.46 |
| 1989-98 Avg. | 1.22 | 1.12 | 0.49 | 0.18 | 0.29 |

^a Average prices are determined only from fish ticket information and may not reflect retroactive or postseason adjustments.

^b Average price for sockeyes and cohos includes only those fish actually sold and does not include hatchery cost recovery fish that were donated or discarded.

Appendix Table 4. Salmon average weight in pounds per fish by species in the commercial fishery, Lower Cook Inlet, 1979 - 1999^a.

| Year | Chinook | Sockeye | Coho | Pink | Chum |
|--------------|---------|---------|------|------|------|
| 1979 | 18.9 | 6.3 | 6.2 | 3.5 | 8.2 |
| 1980 | 21.7 | 5.5 | 5.2 | 3.2 | 7.8 |
| 1981 | 12.5 | 6.1 | 8.5 | 3.7 | 8.1 |
| 1982 | 20.6 | 6.0 | 9.0 | 3.2 | 9.0 |
| 1983 | 22.8 | 5.0 | 7.2 | 3.0 | 9.2 |
| 1984 | 28.8 | 4.7 | 8.8 | 3.5 | 8.9 |
| 1985 | 28.0 | 4.7 | 9.8 | 3.5 | 8.2 |
| 1986 | 20.6 | 4.3 | 8.6 | 3.4 | 8.1 |
| 1987 | 18.1 | 4.9 | 8.2 | 3.5 | 8.3 |
| 1988 | 15.3 | 4.8 | 8.9 | 3.0 | 9.4 |
| 1989 | 14.1 | 4.6 | 7.0 | 3.1 | 8.6 |
| 1990 | 13.8 | 4.1 | 7.1 | 2.8 | 8.9 |
| 1991 | 12.3 | 4.2 | 6.6 | 2.6 | 7.5 |
| 1992 | 12.3 | 4.4 | 7.7 | 3.2 | 8.8 |
| 1993 | 12.0 | 4.4 | 6.0 | 2.7 | 6.2 |
| 1994 | 15.0 | 4.1 | 10.2 | 3.0 | 6.4 |
| 1995 | 17.8 | 4.7 | 7.4 | 2.9 | 6.4 |
| 1996 | 16.9 | 5.2 | 7.6 | 2.9 | 8.0 |
| 1997 | 13.9 | 4.9 | 7.8 | 3.1 | 7.6 |
| 1998 | 13.1 | 4.6 | 8.5 | 3.1 | 7.4 |
| 1999 | 14.8 | 4.7 | 6.6 | 2.5 | 7.9 |
| 20-Year Avg. | 17.4 | 5.0 | 7.8 | 3.2 | 8.1 |
| 1979-88 Avg. | 20.7 | 5.2 | 8.0 | 3.4 | 8.5 |
| 1989-98 Avg. | 14.1 | 4.5 | 7.6 | 2.9 | 7.6 |

^a Values obtained from ADF&G fish ticket database.

Appendix Table 5. Commercial salmon catch in numbers of fish by species, Lower Cook Inlet, 1979 - 1999^a.

| Year | Chinook | Sockeye | Coho | Pink | Chum | Total |
|-----------------|---------|---------|--------|-----------|---------|-----------|
| 1979 | 1,238 | 64,417 | 12,393 | 2,990,929 | 218,490 | 3,287,467 |
| 1980 | 424 | 69,442 | 14,505 | 889,703 | 73,492 | 1,047,566 |
| 1981 | 1,086 | 110,255 | 10,776 | 3,279,183 | 336,093 | 3,737,393 |
| 1982 | 1,066 | 131,320 | 46,892 | 551,589 | 198,185 | 929,052 |
| 1983 | 873 | 187,645 | 11,219 | 927,607 | 192,319 | 1,319,663 |
| 1984 | 714 | 268,950 | 16,797 | 700,622 | 92,540 | 1,079,623 |
| 1985 | 1,043 | 278,694 | 10,327 | 1,229,708 | 30,640 | 1,550,412 |
| 1986 | 796 | 234,861 | 18,852 | 1,408,293 | 82,688 | 1,745,490 |
| 1987 | 1,179 | 248,848 | 14,354 | 201,429 | 157,018 | 622,828 |
| 1988 | 1,694 | 319,008 | 7,946 | 921,296 | 321,911 | 1,571,855 |
| 1989 | 1,893 | 163,271 | 12,089 | 1,296,926 | 11,305 | 1,485,484 |
| 1990 | 1,560 | 203,895 | 9,297 | 383,670 | 6,951 | 605,373 |
| 1991 | 1,419 | 317,947 | 19,047 | 828,709 | 24,232 | 1,191,354 |
| 1992 | 1,891 | 176,644 | 5,902 | 479,768 | 22,203 | 686,408 |
| 1993 | 2,168 | 233,834 | 13,477 | 866,774 | 4,367 | 1,120,620 |
| 1994 | 1,231 | 115,418 | 14,673 | 1,647,929 | 5,469 | 1,784,720 |
| 1995 | 2,303 | 265,423 | 17,709 | 2,848,464 | 15,636 | 3,149,535 |
| 1996 | 1,181 | 449,685 | 13,572 | 451,506 | 3,764 | 919,708 |
| 1997 | 1,262 | 240,184 | 11,004 | 2,814,431 | 5,908 | 3,072,789 |
| 1998 | 1,071 | 284,029 | 16,653 | 1,457,819 | 4,647 | 1,764,219 |
| 1999 | 1,764 | 476,779 | 8,033 | 1,140,488 | 7,941 | 1,635,005 |
| 20-Year Avg. | 1,305 | 218,189 | 14,874 | 1,308,818 | 90,393 | 1,633,578 |
| 1979-88 Avg. | 1,011 | 191,344 | 16,406 | 1,310,036 | 170,338 | 1,689,135 |
| 1989-98 Avg. | 1,598 | 245,033 | 13,342 | 1,307,600 | 10,448 | 1,578,021 |
| 1999 % of Total | 0.11% | 29.16% | 0.49% | 69.75% | 0.49% | 100.00% |

^a Data source: ADF&G fish ticket database.

Appendix Table 6. Commercial salmon catch in numbers of fish by species in the Southern District, Lower Cook Inlet, 1979 - 1999^a.

| Year | Chinook | Sockeye | Coho | Pink | Chum | Total |
|-----------------|---------|---------|--------|-----------|--------|-----------|
| 1979 | 1,199 | 37,342 | 10,846 | 986,909 | 8,221 | 1,044,517 |
| 1980 | 414 | 42,929 | 11,568 | 478,019 | 4,605 | 537,535 |
| 1981 | 1,024 | 77,880 | 7,976 | 1,453,982 | 20,920 | 1,561,782 |
| 1982 | 926 | 43,433 | 7,165 | 296,556 | 18,466 | 366,546 |
| 1983 | 858 | 133,671 | 3,433 | 690,254 | 14,281 | 842,497 |
| 1984 | 661 | 160,654 | 3,193 | 336,595 | 8,065 | 509,168 |
| 1985 | 1,007 | 84,149 | 4,258 | 518,889 | 5,513 | 613,816 |
| 1986 | 776 | 36,838 | 3,095 | 542,521 | 5,560 | 588,790 |
| 1987 | 1,158 | 89,662 | 2,163 | 90,522 | 5,030 | 188,535 |
| 1988 | 1,655 | 105,302 | 2,987 | 852,382 | 7,742 | 970,068 |
| 1989 | 1,889 | 98,052 | 6,667 | 987,488 | 3,141 | 1,097,237 |
| 1990 | 1,546 | 82,412 | 1,552 | 178,087 | 2,433 | 266,030 |
| 1991 | 1,399 | 170,224 | 9,415 | 253,962 | 1,962 | 436,962 |
| 1992 | 1,852 | 106,793 | 1,277 | 417,021 | 1,885 | 528,828 |
| 1993 | 2,162 | 159,747 | 4,431 | 692,794 | 2,788 | 861,922 |
| 1994 | 1,230 | 64,531 | 1,373 | 1,589,709 | 2,631 | 1,659,474 |
| 1995 | 2,289 | 164,798 | 5,161 | 2,475,312 | 4,530 | 2,652,090 |
| 1996 | 1,180 | 358,163 | 9,543 | 444,236 | 3,511 | 816,633 |
| 1997 | 1,262 | 188,413 | 5,597 | 2,685,764 | 4,260 | 2,885,296 |
| 1998 | 1,070 | 196,262 | 2,243 | 1,315,042 | 3,956 | 1,518,534 |
| 1999 | 1,760 | 243,444 | 2,757 | 1,105,267 | 4,624 | 1,357,852 |
| 20-Year Avg. | 1,278 | 117,304 | 5,301 | 811,138 | 6,553 | 941,574 |
| 1979-88 Avg. | 968 | 81,186 | 5,668 | 624,663 | 9,840 | 722,325 |
| 1989-98 Avg. | 1,588 | 158,940 | 4,726 | 1,103,942 | 3,110 | 1,272,305 |
| 1999 % of Total | 0.13% | 17.93% | 0.20% | 81.40% | 0.34% | 100.00% |

^a Data source: ADF&G fish ticket database.

Appendix Table 7. Commercial set gillnet catch of salmon in numbers of fish by species in the Southern District, Lower Cook Inlet, 1979 - 1999^a.

| Year | Chinook | Sockeye | Coho | Pink | Chum | Total |
|-----------------|---------|---------|-------|--------|--------|---------|
| 1979 | 483 | 34,367 | 7,595 | 69,368 | 5,266 | 117,079 |
| 1980 | 225 | 29,922 | 8,038 | 26,613 | 2,576 | 67,374 |
| 1981 | 222 | 53,665 | 6,735 | 68,794 | 8,524 | 137,940 |
| 1982 | 894 | 42,389 | 5,557 | 15,838 | 7,113 | 71,791 |
| 1983 | 822 | 41,707 | 1,799 | 20,533 | 4,377 | 69,238 |
| 1984 | 639 | 40,987 | 2,862 | 17,836 | 5,008 | 67,332 |
| 1985 | 958 | 23,188 | 3,908 | 22,898 | 4,221 | 55,173 |
| 1986 | 745 | 21,807 | 2,827 | 14,244 | 2,426 | 42,049 |
| 1987 | 653 | 28,209 | 2,025 | 9,224 | 2,419 | 42,530 |
| 1988 | 1,145 | 14,758 | 2,819 | 29,268 | 4,423 | 52,413 |
| 1989 | 1,281 | 13,970 | 4,792 | 16,210 | 1,877 | 38,130 |
| 1990 | 1,361 | 15,863 | 1,046 | 12,646 | 1,938 | 32,854 |
| 1991 | 842 | 20,525 | 5,011 | 3,954 | 1,577 | 31,909 |
| 1992 | 1,288 | 17,002 | 848 | 15,958 | 1,687 | 36,783 |
| 1993 | 1,089 | 14,791 | 3,088 | 12,008 | 2,591 | 33,567 |
| 1994 | 1,103 | 14,004 | 1,073 | 23,621 | 2,419 | 42,220 |
| 1995 | 2,078 | 19,406 | 3,564 | 41,654 | 3,958 | 70,660 |
| 1996 | 1,054 | 69,338 | 5,779 | 14,813 | 2,792 | 93,776 |
| 1997 | 1,136 | 59,412 | 4,475 | 64,162 | 4,166 | 133,351 |
| 1998 | 952 | 26,131 | 1,057 | 24,403 | 3,754 | 56,297 |
| 1999 | 1,491 | 27,646 | 1,374 | 5,348 | 4,313 | 40,194 |
| 20-Year Avg. | 949 | 33,112 | 3,845 | 25,560 | 3,674 | 67,139 |
| 1979-88 Avg. | 679 | 33,100 | 4,417 | 29,462 | 4,635 | 72,292 |
| 1989-98 Avg. | 1,218 | 27,044 | 3,073 | 22,943 | 2,676 | 56,955 |
| 1999 % of Total | 3.71% | 68.78% | 3.42% | 13.31% | 10.79% | 100.00% |

^a Data source: ADF&G fish ticket database.

Appendix Table 8. Commercial salmon catch in numbers of fish by species in the Outer District, Lower Cook Inlet, 1979 - 1999^a.

| Year | Chinook | Sockeye | Coho | Pink | Chum | Total |
|-----------------|---------|---------|-------|-----------|---------|-----------|
| 1979 | 30 | 25,297 | 135 | 1,945,536 | 180,558 | 2,151,556 |
| 1980 | 10 | 22,514 | 16 | 154,041 | 32,246 | 208,827 |
| 1981 | 61 | 18,133 | 485 | 1,714,115 | 238,393 | 1,971,187 |
| 1982 | 129 | 66,781 | 92 | 67,523 | 63,075 | 197,600 |
| 1983 | 14 | 16,835 | 54 | 199,794 | 27,203 | 243,900 |
| 1984 | 3 | 29,276 | 41 | 89,085 | 3,204 | 121,609 |
| 1985 | 19 | 91,957 | 3,210 | 618,222 | 11,844 | 725,252 |
| 1986 | 6 | 48,472 | 5,052 | 401,755 | 11,701 | 466,986 |
| 1987 | 14 | 31,845 | 2,481 | 23,890 | 28,663 | 86,893 |
| 1988 | 5 | 9,501 | 2 | 6,094 | 71,202 | 86,804 |
| 1989 | 1 | 10,286 | 72 | 52,677 | 43 | 63,079 |
| 1990 | 2 | 17,404 | 74 | 191,320 | 614 | 209,414 |
| 1991 | 2 | 6,408 | 12 | 359,664 | 14,337 | 380,423 |
| 1992 | 0 | 572 | 1 | 146 | 181 | 900 |
| 1993 | 2 | 4,613 | 119 | 159,159 | 970 | 164,863 |
| 1994 | 0 | 5,930 | 993 | 13,200 | 32 | 20,155 |
| 1995 | 12 | 17,642 | 1,272 | 192,098 | 474 | 211,498 |
| 1996 | 0 | 14,999 | 96 | 7,199 | 3 | 22,297 |
| 1997 | 0 | 6,255 | 63 | 128,373 | 1,575 | 136,266 |
| 1998 | 0 | 15,991 | 45 | 102,172 | 611 | 118,819 |
| 1999 | 3 | 51,117 | 1,482 | 32,484 | 2,062 | 87,148 |
| 20-Year Avg. | 16 | 22,771 | 716 | 319,699 | 35,277 | 378,478 |
| 1979-88 Avg. | 29 | 36,061 | 1,157 | 522,006 | 66,809 | 626,061 |
| 1989-98 Avg. | 2 | 10,010 | 275 | 120,601 | 1,884 | 132,771 |
| 1999 % of Total | 0.00% | 58.66% | 1.70% | 37.27% | 2.37% | 100.00% |

^a Data source: ADF&G fish ticket database.

Appendix Table 9. Commercial salmon catch in numbers of fish by species in the Eastern District, Lower Cook Inlet, 1979 - 1999^a.

| Year | Chinook | Sockeye | Coho | Pink | Chum | Total |
|-----------------|---------|---------|--------|---------|--------|---------|
| 1979 | 0 | 0 | 296 | 0 | 0 | 296 |
| 1980 | 0 | 122 | 426 | 155,779 | 720 | 157,047 |
| 1981 | 0 | 9,270 | 470 | 44,989 | 3,279 | 58,008 |
| 1982 | 0 | 3,092 | 950 | 143,639 | 7,698 | 155,379 |
| 1983 | 0 | 25,932 | 594 | 36,154 | 7,934 | 70,614 |
| 1984 | 47 | 54,420 | 536 | 136,797 | 10,535 | 202,335 |
| 1985 | 11 | 24,338 | 835 | 92,403 | 5,144 | 122,731 |
| 1986 | 0 | 3,055 | 770 | 40,243 | 3,757 | 47,825 |
| 1987 | 0 | 3,687 | 1,631 | 14,333 | 14,913 | 34,564 |
| 1988 | 1 | 20,253 | 486 | 1,740 | 24,668 | 47,148 |
| 1989 | 0 | 8,538 | 5,346 | 92 | 312 | 14,288 |
| 1990 | 0 | 7,682 | 7,645 | 11,815 | 307 | 27,449 |
| 1991 | 1 | 4,703 | 7,283 | 167,250 | 80 | 179,317 |
| 1992 | 0 | 432 | 3,136 | 60,007 | 86 | 63,661 |
| 1993 | 0 | 1,824 | 8,924 | 10,616 | 9 | 21,373 |
| 1994 | 1 | 9,661 | 10,410 | 44,987 | 2,792 | 67,851 |
| 1995 | 0 | 46,556 | 5,192 | 12,000 | 330 | 64,078 |
| 1996 | 0 | 44,919 | 3,932 | 36 | 223 | 49,110 |
| 1997 | 0 | 33,783 | 5,344 | 1 | 66 | 39,194 |
| 1998 | 1 | 44,274 | 14,365 | 38,829 | 51 | 97,520 |
| 1999 | 1 | 135,305 | 3,794 | 1,930 | 1,232 | 142,262 |
| 20-Year Avg. | 3 | 15,113 | 3,239 | 50,131 | 4,148 | 72,635 |
| 1979-88 Avg. | 6 | 14,417 | 699 | 66,608 | 7,865 | 89,595 |
| 1989-98 Avg. | 0 | 20,237 | 7,158 | 34,563 | 426 | 62,384 |
| 1999 % of Total | 0.00% | 95.11% | 2.67% | 1.36% | 0.87% | 100.00% |

^a Data source: ADF&G fish ticket database.

Appendix Table 10. Commercial salmon catch in numbers of fish by species in the Kamishak Bay District, Lower Cook Inlet, 1979 - 1999^a.

| Year | Chinook | Sockeye | Coho | Pink | Chum | Total |
|-----------------|---------|---------|--------|---------|---------|---------|
| 1979 | 9 | 1,778 | 1,116 | 58,484 | 29,711 | 91,098 |
| 1980 | 0 | 3,877 | 2,495 | 101,864 | 35,921 | 144,157 |
| 1981 | 1 | 4,972 | 1,845 | 66,097 | 73,501 | 146,416 |
| 1982 | 11 | 18,014 | 38,685 | 43,871 | 108,946 | 209,527 |
| 1983 | 1 | 11,207 | 7,138 | 1,405 | 142,901 | 162,652 |
| 1984 | 3 | 24,600 | 13,027 | 138,145 | 70,736 | 246,511 |
| 1985 | 6 | 78,250 | 2,024 | 194 | 8,139 | 88,613 |
| 1986 | 14 | 146,496 | 9,935 | 423,774 | 61,670 | 641,889 |
| 1987 | 7 | 123,654 | 8,079 | 72,684 | 108,412 | 312,836 |
| 1988 | 33 | 183,952 | 4,471 | 61,080 | 218,299 | 467,835 |
| 1989 | 3 | 46,395 | 4 | 256,669 | 7,809 | 310,880 |
| 1990 | 12 | 96,397 | 26 | 2,448 | 3,597 | 102,480 |
| 1991 | 17 | 136,612 | 2,337 | 47,833 | 7,853 | 194,652 |
| 1992 | 39 | 68,847 | 1,488 | 2,594 | 20,051 | 93,019 |
| 1993 | 4 | 67,650 | 3 | 4,205 | 600 | 72,462 |
| 1994 | 0 | 35,296 | 1,897 | 33 | 14 | 37,240 |
| 1995 | 2 | 36,427 | 6,084 | 169,054 | 10,302 | 221,869 |
| 1996 | 1 | 31,604 | 1 | 35 | 27 | 31,668 |
| 1997 | 0 | 11,733 | 0 | 293 | 7 | 12,033 |
| 1998 | 0 | 27,502 | 0 | 1,776 | 29 | 29,307 |
| 1999 | 0 | 46,913 | 0 | 807 | 23 | 47,743 |
| 20-Year Avg. | 8 | 56,619 | 5,112 | 72,587 | 47,858 | 182,185 |
| 1979-88 Avg. | 9 | 59,680 | 8,882 | 96,760 | 85,824 | 251,153 |
| 1989-98 Avg. | 8 | 55,846 | 1,184 | 48,494 | 5,029 | 110,561 |
| 1999 % of Total | 0.00% | 98.26% | 0.00% | 1.69% | 0.05% | 100.00% |

^a Data source: ADF&G fish ticket database.

Appendix Table 11. Total commercial salmon catch in numbers of fish by district, Lower Cook Inlet, 1979 - 1999^a.

| Year | Southern | Outer | Kamishak | Eastern | Total |
|-----------------|-----------|-----------|----------|---------|-----------|
| 1979 | 1,044,517 | 2,151,556 | 91,098 | 296 | 3,287,467 |
| 1980 | 537,535 | 208,827 | 144,157 | 157,047 | 1,047,566 |
| 1981 | 1,561,782 | 1,971,187 | 146,416 | 58,008 | 3,737,393 |
| 1982 | 366,546 | 197,600 | 209,527 | 155,379 | 929,052 |
| 1983 | 842,497 | 243,900 | 162,652 | 70,614 | 1,319,663 |
| 1984 | 509,168 | 121,609 | 246,511 | 202,335 | 1,079,623 |
| 1985 | 613,816 | 725,252 | 88,613 | 122,731 | 1,550,412 |
| 1986 | 588,790 | 466,986 | 641,889 | 47,825 | 1,745,490 |
| 1987 | 188,535 | 86,893 | 312,836 | 34,564 | 622,828 |
| 1988 | 970,068 | 86,804 | 467,835 | 47,148 | 1,571,855 |
| 1989 | 1,097,237 | 63,079 | 310,880 | 14,288 | 1,485,484 |
| 1990 | 266,030 | 209,414 | 102,480 | 27,449 | 605,373 |
| 1991 | 436,962 | 380,423 | 194,652 | 179,317 | 1,191,354 |
| 1992 | 528,828 | 900 | 93,019 | 63,661 | 686,408 |
| 1993 | 861,922 | 164,863 | 72,462 | 21,373 | 1,120,620 |
| 1994 | 1,659,474 | 20,155 | 37,240 | 67,851 | 1,784,720 |
| 1995 | 2,652,090 | 211,498 | 221,869 | 64,078 | 3,149,535 |
| 1996 | 816,633 | 22,297 | 31,668 | 49,110 | 919,708 |
| 1997 | 2,885,296 | 136,266 | 12,033 | 39,194 | 3,072,789 |
| 1998 | 1,518,573 | 118,819 | 29,307 | 97,520 | 1,764,219 |
| 1999 | 1,357,852 | 87,148 | 47,743 | 142,262 | 1,635,005 |
| 20-Year Avg. | 941,596 | 378,489 | 182,185 | 72,634 | 1,574,905 |
| 1979-88 Avg. | 665,739 | 627,409 | 209,955 | 87,922 | 1,591,025 |
| 1989-98 Avg. | 1,217,454 | 129,570 | 154,414 | 57,347 | 1,558,785 |
| 1999 % of Total | 86.08% | 6.73% | 1.66% | 5.53% | 100.00% |

^a Data source: ADF&G fish tucker database.

Appendix Table 12. Commercial chinook salmon catch in numbers of fish by district, Lower Cook Inlet, 1979 - 1999^a.

| Year | Southern | Outer | Kamishak | Eastern | Total |
|-----------------|----------|-------|----------|---------|---------|
| 1979 | 1,199 | 30 | 9 | 0 | 1,238 |
| 1980 | 414 | 10 | 0 | 0 | 424 |
| 1981 | 1,024 | 61 | 1 | 0 | 1,086 |
| 1982 | 926 | 129 | 11 | 0 | 1,066 |
| 1983 | 858 | 14 | 1 | 0 | 873 |
| 1984 | 661 | 3 | 3 | 47 | 714 |
| 1985 | 1,007 | 19 | 6 | 11 | 1,043 |
| 1986 | 776 | 6 | 14 | 0 | 796 |
| 1987 | 1,158 | 14 | 7 | 0 | 1,179 |
| 1988 | 1,655 | 5 | 33 | 1 | 1,694 |
| 1989 | 1,889 | 1 | 3 | 0 | 1,893 |
| 1990 | 1,546 | 2 | 12 | 0 | 1,560 |
| 1991 | 1,399 | 2 | 17 | 1 | 1,419 |
| 1992 | 1,852 | 0 | 39 | 0 | 1,891 |
| 1993 | 2,162 | 2 | 4 | 0 | 2,168 |
| 1994 | 1,230 | 0 | 0 | 1 | 1,231 |
| 1995 | 2,289 | 12 | 2 | 0 | 2,303 |
| 1996 | 1,180 | 0 | 1 | 0 | 1,181 |
| 1997 | 1,262 | 0 | 0 | 0 | 1,262 |
| 1998 | 1,070 | 0 | 0 | 1 | 1,071 |
| 1999 | 1,760 | 3 | 0 | 1 | 1,764 |
| 20-Year Avg. | 1,300 | 27 | 8 | 3 | 1,338 |
| 1979-88 Avg. | 953 | 52 | 5 | 6 | 1,017 |
| 1989-98 Avg. | 1,646 | 2 | 11 | 0 | 1,660 |
| 1999 % of Total | 99.91% | 0.00% | 0.00% | 0.09% | 100.00% |

^a Data source: ADF&G fish ticket database.

Appendix Table 13. Commercial sockeye salmon catch in numbers of fish by district, Lower Cook Inlet, 1979 - 1999^a.

| Year | Southern | Outer | Kamishak | Eastern | Total |
|-----------------|----------|--------|----------|---------|---------|
| 1979 | 37,342 | 25,297 | 1,778 | 0 | 64,417 |
| 1980 | 42,929 | 22,514 | 3,877 | 122 | 69,442 |
| 1981 | 77,880 | 18,133 | 4,972 | 9,270 | 110,255 |
| 1982 | 43,433 | 66,781 | 18,014 | 3,092 | 131,320 |
| 1983 | 133,671 | 16,835 | 11,207 | 25,932 | 187,645 |
| 1984 | 160,654 | 29,276 | 24,600 | 54,420 | 268,950 |
| 1985 | 84,149 | 91,957 | 78,250 | 24,338 | 278,694 |
| 1986 | 36,838 | 48,472 | 146,496 | 3,055 | 234,861 |
| 1987 | 89,662 | 31,845 | 123,654 | 3,687 | 248,848 |
| 1988 | 105,302 | 9,501 | 183,952 | 20,253 | 319,008 |
| 1989 | 98,052 | 10,286 | 46,395 | 8,538 | 163,271 |
| 1990 | 82,412 | 17,404 | 96,397 | 7,682 | 203,895 |
| 1991 | 170,224 | 6,408 | 136,612 | 4,703 | 317,947 |
| 1992 | 106,793 | 572 | 68,847 | 432 | 176,644 |
| 1993 | 159,747 | 4,613 | 67,650 | 1,824 | 233,834 |
| 1994 | 64,531 | 5,930 | 35,296 | 9,661 | 115,418 |
| 1995 | 164,798 | 17,642 | 36,427 | 46,556 | 265,423 |
| 1996 | 358,163 | 14,999 | 31,604 | 44,919 | 449,685 |
| 1997 | 188,413 | 6,255 | 11,733 | 33,783 | 240,184 |
| 1998 | 196,262 | 15,991 | 27,502 | 44,274 | 284,029 |
| 1999 | 243,444 | 51,117 | 46,913 | 135,305 | 476,779 |
| 20-Year Avg. | 117,304 | 22,771 | 56,619 | 15,113 | 211,807 |
| 1979-88 Avg. | 84,765 | 36,181 | 41,747 | 12,392 | 175,084 |
| 1989-98 Avg. | 149,844 | 9,361 | 71,491 | 17,835 | 248,531 |
| 1999 % of Total | 69.10% | 5.63% | 9.68% | 15.59% | 100.00% |

^a Data source: ADF&G fish ticket database.

Appendix Table 14. Commercial sockeye salmon catch in thousands of fish by subdistrict, Lower Cook Inlet, 1959 – 1999^a.

| Location | 1959 | 1960 | 1961 | 1962 | 1963 | 1964 | 1965 | 1966 | 1967 | 1968 | 1969 | 1970 | 1971 |
|-----------------------|------|------|------|------|------|------|------|------|------|------|-------|------|------|
| Resurrection Bay | 0 | 0.1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 74.5 | 99.4 | 1.8 | 2.2 |
| Aialik Bay | 1.3 | 0.2 | 4.3 | 2.6 | 0.5 | 0 | 0 | 0 | 0 | 0 | 0 | 3.1 | 0 |
| Nuka Bay | 8.3 | 6.7 | 8.2 | 5.1 | 0.5 | 0 | 2.0 | 0 | 2.2 | 1.5 | 0 | 1.0 | 1.6 |
| Port Dick | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Halibut Cove & Lagoon | 1.3 | 1.4 | 0.8 | 2.0 | 1.1 | 0.7 | 1.4 | 1.5 | 1.9 | 2.7 | 1.7 | 1.3 | 1.3 |
| Tutka/Barabara | 1.1 | 1.7 | 3.0 | 5.2 | 2.9 | 9.0 | 5.2 | 6.0 | 11.8 | 6.3 | 5.6 | 6.0 | 10.0 |
| Seldovia Bay | 0.4 | 1.2 | 1.2 | 1.7 | 1.2 | 2.1 | 0.9 | 1.0 | 2.2 | 1.9 | 1.1 | 1.2 | 1.5 |
| Port Graham Bay | 6.6 | 7.8 | 5.2 | 6.8 | 7.8 | 5.5 | 3.5 | 2.7 | 10.4 | 7.7 | 4.3 | 3.7 | 5.6 |
| Kamishak/Douglas | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| McNeil (Mikfik) | 0 | 0.7 | 0 | 0 | 0 | 1.9 | 0.2 | 0 | 0 | 0 | 8.9 | 2.8 | 0 |
| Paint River | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Chenik Lake | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.2 | 0 | 1.9 | 0 | 0 |
| Bruin (Kirschner) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Miscellaneous | 2.6 | 4.9 | 0.1 | 1.9 | 1.1 | 1.5 | 0.8 | 4.1 | 0.3 | 0.6 | 0.1 | 0 | 0 |
| Totals | 21.6 | 24.7 | 22.8 | 25.3 | 15.1 | 20.7 | 14.0 | 15.3 | 29.0 | 95.2 | 122.8 | 20.9 | 22.2 |

| Location | 1972 | 1973 | 1974 | 1975 | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 |
|-----------------------|------|------|------|------|------|-------|-------|------|------|-------|-------|-------|-------|
| Resurrection Bay | 0.1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.6 | 0 | 0 | 3.4 |
| Aialik Bay | 0.3 | 3.1 | 0.2 | 0.6 | 0 | 5.8 | 0 | 0 | 0.1 | 8.7 | 3.0 | 25.9 | 50.8 |
| Nuka Bay | 26.1 | 1.1 | 0.1 | 0 | 18.9 | 31.1 | 10.6 | 24.4 | 21.5 | 17.2 | 66.3 | 16.8 | 29.2 |
| Port Dick | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Halibut Cove & Lagoon | 3.7 | 2.1 | 3.0 | 3.4 | 5.1 | 3.6 | 12.9 | 5.3 | 11.5 | 11.2 | 1.2 | 77.7 | 116.6 |
| Tutka/Barabara | 14.8 | 8.1 | 10.8 | 12.6 | 14.2 | 21.3 | 92.1 | 15.6 | 13.2 | 41.0 | 15.8 | 35.9 | 26.7 |
| Seldovia Bay | 2.3 | 2.2 | 2.3 | 2.1 | 2.1 | 3.0 | 5.6 | 2.6 | 1.6 | 5.3 | 5.0 | 6.7 | 4.9 |
| Port Graham Bay | 10.5 | 11.7 | 10.9 | 9.2 | 13.8 | 16.6 | 30.5 | 12.9 | 16.5 | 20.3 | 21.5 | 13.4 | 12.5 |
| Kamishak/Douglas | 0 | 0 | 0 | 0 | 0.2 | 5.3 | 4.6 | 0.5 | 0 | 4.9 | 0 | 2.8 | 0 |
| McNeil (Mikfik) | 0 | 0 | 0 | 0 | 3.8 | 2.1 | 0 | 1.2 | 3.9 | 0 | 17.8 | 5.8 | 10.7 |
| Paint River | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Chenik Lake | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.3 | 2.7 | 13.9 |
| Bruin (Kirschner) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Miscellaneous | 0.1 | 0.8 | 0.1 | 0.2 | 0.3 | 2.8 | 0.1 | 1.9 | 1.1 | 1.1 | 0.4 | 0 | 0.3 |
| Totals | 57.9 | 29.1 | 27.4 | 28.1 | 58.2 | 101.6 | 156.4 | 64.4 | 69.4 | 110.3 | 131.3 | 187.6 | 269.0 |

| Location | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 |
|-------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Resurrection Bay | 0.3 | 0 | 0.2 | 0 | 0 | 0 | 0 | 0 | 1.7 | 9.0 | 44.6 | 43.9 | 31.7 |
| Aialik Bay | 24.1 | 3.0 | 3.5 | 20.2 | 8.5 | 7.7 | 4.7 | 0.4 | 0.2 | 0.6 | 2.0 | 1.0 | 2.1 |
| Nuka Bay | 91.8 | 48.4 | 31.8 | 9.5 | 10.3 | 5.7 | 1.8 | 0 | 3.5 | 5.9 | 17.6 | 15.0 | 6.2 |
| Port Dick | 0 | 0 | 0 | 0 | 0 | 11.7 | 4.6 | 0.6 | 1.0 | 0 | 0 | 0 | 0 |
| Halibut Cove & Lagoon | 63.2 | 15.2 | 69.1 | 24.9 | 46.6 | 20.3 | 36.0 | 14.7 | 19.0 | 12.2 | 9.0 | 75.3 | 12.3 |
| China Poot ^b | | | | 63.6 | 35.8 | 49.9 | 116.7 | 76.0 | 127.6 | 38.7 | 133.4 | 225.2 | 116.1 |
| Tutka/Barabara | 14.9 | 16.3 | 14.7 | 12.9 | 13.4 | 7.9 | 13.4 | 12.9 | 8.4 | 11.0 | 15.4 | 27.8 | 14.4 |
| Seldovia Bay | 2.6 | 3.2 | 3.5 | 2.5 | 1.8 | 4.3 | 4.0 | 3.3 | 4.4 | 2.7 | 4.2 | 11.9 | 12.5 |
| Port Graham Bay | 3.5 | 2.0 | 2.4 | 1.4 | 0 | 0 | 0 | 0 | 0 | 0 | 2.6 | 17.9 | 33.1 |
| Kamishak/Douglas | 0.7 | 7.6 | 2.3 | 5 | 0 | 0.1 | 7.0 | 9.9 | 1.3 | 3.4 | 2.7 | 0 | 2.6 |
| McNeil (Mikfik) | 67.0 | 27.5 | 21.4 | 14.6 | 7.0 | 9.1 | 12.9 | 4.0 | 0.9 | 0 | 0.1 | 0 | 0.2 |
| Paint River | 0 | 0 | 0 | 0 | 0 | 0 | 0.4 | 0 | 0 | 0 | 0 | 0 | 0 |
| Chenik Lake | 10.6 | 111.3 | 98.5 | 164.2 | 38.9 | 70.3 | 60.4 | 14.4 | 24.6 | 0 | 0 | 0 | 0 |
| Bruin/Kirschner | 0 | 0 | 0 | 0 | 0.2 | 14.5 | 55.9 | 40.5 | 39.7 | 31.9 | 33.6 | 31.6 | 9.0 |
| Miscellaneous | 0 | 0.4 | 1.6 | 0.2 | 0.8 | 2.4 | 0.1 | 0 | 1.5 | 0 | 0.2 | 0 | 0 |
| Totals | 278.7 | 234.9 | 248.8 | 319.0 | 163.3 | 203.9 | 317.9 | 176.6 | 233.8 | 115.4 | 265.4 | 449.7 | 240.2 |

- continued -

Appendix Table 14. (page 2 of 2)

| Location | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|-------------------------|-------|-------|------|------|------|------|------|------|------|------|------|------|------|
| Resurrection Bay | 35.0 | 135.2 | | | | | | | | | | | |
| Aialik Bay | 8.6 | 0.1 | | | | | | | | | | | |
| Nuka Bay | 16.0 | 51.1 | | | | | | | | | | | |
| Port Dick | 0 | 0 | | | | | | | | | | | |
| Halibut Cove & Lagoon | 62.3 | 42.9 | | | | | | | | | | | |
| China Poot ^b | 100.2 | 170.6 | | | | | | | | | | | |
| Tutka/Barabara | 9.8 | 22.9 | | | | | | | | | | | |
| Seldovia Bay | 6.0 | 6.3 | | | | | | | | | | | |
| Port Graham Bay | 17.9 | 0.7 | | | | | | | | | | | |
| Kamishak/Douglas | 0 | 0 | | | | | | | | | | | |
| McNeil (Mikfik) | 0 | 7.2 | | | | | | | | | | | |
| Paint River | 0 | 0 | | | | | | | | | | | |
| Chenik Lake | 0 | 0 | | | | | | | | | | | |
| Bruin/Kirschner | 27.5 | 39.8 | | | | | | | | | | | |
| Miscellaneous | 0.7 | 0 | | | | | | | | | | | |
| Totals | 284.0 | 476.8 | | | | | | | | | | | |

^a Data source: ADF&G fish ticket database.

^b China Poot Subdistrict, which includes China Poot, Peterson, and Neptune Bays, was part of Halibut Cove Subdistrict prior to 1988.

Appendix Table 15. Harvest of sockeye salmon returning to China Poot Bay in the Southern District of Lower Cook Inlet, by user group, 1979 - 1999^a.

| Return Year | Sport Harvest | Personal Use Harvest | Commercial Harvest | Non-harvested fish | Total Return |
|-----------------|------------------|----------------------|----------------------|--------------------|--------------|
| 1979 | 650 | 0 | ^b | 0 | 650 |
| 1980 | 1,000 | 1,000 | 12,000 | 0 | 14,000 |
| 1981 | 1,500 | 0 | 10,000 | 0 | 11,500 |
| 1982 | 450 | 1,320 | 200 | 1,430 | 3,400 |
| 1983 | 480 | 5,910 | 84,020 | 10 | 90,420 |
| 1984 | 500 | 2,000 | 114,360 | 500 | 117,360 |
| 1985 | 500 | 3,000 | 61,500 | 920 | 65,920 |
| 1986 | 100 | 150 | 18,350 | 200 | 18,800 |
| 1987 | 200 | 2,000 | 21,500 | 0 | 23,700 |
| 1988 | 500 | 1,500 | 91,469 | 470 | 93,939 |
| 1989 | 1,000 | 7,000 | 79,714 | 0 | 87,714 |
| 1990 | 500 | 3,000 | 49,587 | 0 | 53,087 |
| 1991 | 1,000 | 4,000 | 117,000 ^c | 0 | 122,000 |
| 1992 | 300 | 3,500 | 89,791 ^c | 0 | 93,591 |
| 1993 | 400 | 4,000 | 144,677 ^c | 0 | 149,077 |
| 1994 | 500 | 8,500 | 50,527 ^c | 0 | 59,527 |
| 1995 | 1,000 | 7,000 | 145,392 ^c | 450 | 153,842 |
| 1996 | 1,000 | 9,000 | 200,000 ^c | 441 | 210,441 |
| 1997 | 640 ^d | 4,950 ^d | 120,900 ^c | 1,130 | 127,620 |
| 1998 | 668 ^d | 5,494 ^d | 164,000 ^c | 380 | 170,542 |
| 1999 | 668 ^d | 5,494 ^d | 219,300 ^c | 522 | 225,983 |
| 1979-98 Average | 644 | 3,859 | 82,879 | 312 | 87,694 |

^a Through 1990, "Commercial Harvest" and "Total Return" includes returns only to Leisure Lake in China Poot Bay; after 1990, these figures include combined returns to both Leisure Lake in China Poot Bay and Hazel Lake in Neptune Bay.

^b No data.

^c Portions of the commercial sockeye harvest in China Poot, Halibut Cove, and Tutka Bay Subdistricts were attributed to the Leisure and/or Hazel Lake returns.

^d The final "Sport Harvest" and "Personal Use Harvest" estimates for 1997 - 1999 were not available at the time of publishing, therefore figures here represent the recent 10-year averages.

Appendix Table 16. Commercial catch and escapement of sockeye salmon at Chenik Lake in the Kamishak Bay District of Lower Cook Inlet, 1975 - 1999.

| Return Year | Commercial Harvest | Escapement ^a | Total Return |
|--------------------|--------------------|-------------------------|--------------|
| 1975 | ^b | 100 | 100 |
| 1976 | ^b | 900 | 900 |
| 1977 | ^b | 200 | 200 |
| 1978 | ^b | 100 | 100 |
| 1979 | ^b | ^c | ^b |
| 1980 | ^b | 3,500 | 3,500 |
| 1981 | ^b | 2,500 | 2,500 |
| 1982 | ^b | 8,000 | 8,000 |
| 1983 | 2,800 | 11,000 | 13,800 |
| 1984 | 16,500 | 13,000 | 29,500 |
| 1985 | 10,500 | 3,500 | 14,000 |
| 1986 | 111,000 | 7,000 | 118,000 |
| 1987 | 102,000 | 10,000 | 112,000 |
| 1988 | 164,200 | 9,000 | 173,200 |
| 1989 | 38,905 | 12,000 | 50,905 |
| 1990 | 70,347 | 17,000 | 87,347 |
| 1991 | 60,397 | 10,189 | 70,586 |
| 1992 | 13,793 | 9,269 | 23,062 |
| 1993 | 24,567 | 4,000 | 28,567 |
| 1994 | 0 ^d | 808 | 808 |
| 1995 | 0 ^d | 1,086 | 1,086 |
| 1996 | 0 ^d | 2,990 | 2,990 |
| 1997 | 0 ^d | 2,338 | 2,338 |
| 1998 | 0 ^d | 1,880 | 1,880 |
| 1999 | 0 ^d | 2,850 | 2,850 |
| Average Since 1985 | 39,714 | 6,261 | 45,975 |

^a Estimated from aerial surveys from 1975-90 and 1998-99, weir counts from 1991-97.

^b Closed to fishing.

^c No data.

^d Due to low returns, the Chenik Subdistrict was closed to fishing for the entire season.

Appendix Table 17. Commercial coho salmon catch in numbers of fish by district, Lower Cook Inlet, 1979 - 1999^a.

| Year | Southern | Outer | Kamishak | Eastern | Total |
|-----------------|----------|-------|----------|---------|---------|
| 1979 | 10,846 | 135 | 1,116 | 296 | 12,393 |
| 1980 | 11,568 | 16 | 2,495 | 426 | 14,505 |
| 1981 | 7,976 | 485 | 1,845 | 470 | 10,776 |
| 1982 | 7,165 | 92 | 38,685 | 950 | 46,892 |
| 1983 | 3,433 | 54 | 7,138 | 594 | 11,219 |
| 1984 | 3,193 | 41 | 13,027 | 536 | 16,797 |
| 1985 | 4,258 | 3,210 | 2,024 | 835 | 10,327 |
| 1986 | 3,095 | 5,052 | 9,935 | 770 | 18,852 |
| 1987 | 2,163 | 2,481 | 8,079 | 1,631 | 14,354 |
| 1988 | 2,987 | 2 | 4,471 | 486 | 7,946 |
| 1989 | 6,667 | 72 | 4 | 5,346 | 12,089 |
| 1990 | 1,552 | 74 | 26 | 7,645 | 9,297 |
| 1991 | 9,415 | 12 | 2,337 | 7,283 | 19,047 |
| 1992 | 1,277 | 1 | 1,488 | 3,136 | 5,902 |
| 1993 | 4,431 | 119 | 3 | 8,924 | 13,477 |
| 1994 | 1,373 | 993 | 1,897 | 10,410 | 14,673 |
| 1995 | 5,161 | 1,272 | 6,084 | 5,192 | 17,709 |
| 1996 | 9,543 | 96 | 1 | 3,932 | 13,572 |
| 1997 | 5,597 | 63 | 0 | 5,344 | 11,004 |
| 1998 | 2,243 | 45 | 0 | 14,365 | 16,653 |
| 1999 | 2,757 | 1,482 | 0 | 3,794 | 8,033 |
| 20-Year Avg. | 5,301 | 716 | 5,112 | 3,239 | 14,368 |
| 1979-88 Avg. | 5,802 | 1,161 | 8,593 | 709 | 16,264 |
| 1989-98 Avg. | 4,800 | 270 | 1,631 | 5,770 | 12,472 |
| 1999 % of Total | 13.47% | 0.27% | 0.00% | 86.26% | 100.00% |

^a Data source: ADF&G fish ticket database.

Appendix Table 18. Commercial pink salmon catch in numbers of fish by district, Lower Cook Inlet, 1979 - 1999^a.

| Year | Southern | Outer | Kamishak | Eastern | Total |
|-----------------|-----------|-----------|----------|---------|-----------|
| 1979 | 986,909 | 1,945,536 | 58,484 | 0 | 2,990,929 |
| 1980 | 478,019 | 154,041 | 101,864 | 155,779 | 889,703 |
| 1981 | 1,453,982 | 1,714,115 | 66,097 | 44,989 | 3,279,183 |
| 1982 | 296,556 | 67,523 | 43,871 | 143,639 | 551,589 |
| 1983 | 690,254 | 199,794 | 1,405 | 36,154 | 927,607 |
| 1984 | 336,595 | 89,085 | 138,145 | 136,797 | 700,622 |
| 1985 | 518,889 | 618,222 | 194 | 92,403 | 1,229,708 |
| 1986 | 542,521 | 401,755 | 423,774 | 40,243 | 1,408,293 |
| 1987 | 90,522 | 23,890 | 72,684 | 14,333 | 201,429 |
| 1988 | 852,382 | 6,094 | 61,080 | 1,740 | 921,296 |
| 1989 | 987,488 | 52,677 | 256,669 | 92 | 1,296,926 |
| 1990 | 178,087 | 191,320 | 2,448 | 11,815 | 383,670 |
| 1991 | 253,962 | 359,664 | 47,833 | 167,250 | 828,709 |
| 1992 | 417,021 | 146 | 2,594 | 60,007 | 479,768 |
| 1993 | 692,794 | 159,159 | 4,205 | 10,616 | 866,774 |
| 1994 | 1,589,709 | 13,200 | 33 | 44,987 | 1,647,929 |
| 1995 | 2,475,312 | 192,098 | 169,054 | 12,000 | 2,848,464 |
| 1996 | 444,236 | 7,199 | 36 | 35 | 451,506 |
| 1997 | 2,685,764 | 128,373 | 293 | 1 | 2,814,431 |
| 1998 | 1,315,042 | 102,172 | 1,776 | 38,829 | 1,457,819 |
| 1999 | 1,105,267 | 32,484 | 807 | 1,930 | 1,140,488 |
| 20-Year Avg. | 811,138 | 319,699 | 72,587 | 50,131 | 1,253,555 |
| 1979-88 Avg. | 564,601 | 528,404 | 90,750 | 69,408 | 1,253,162 |
| 1989-98 Avg. | 1,057,676 | 110,993 | 54,425 | 30,854 | 1,253,947 |
| 1999 % of Total | 90.21% | 7.01% | 0.12% | 2.66% | 100.00% |

^a Data source: ADF&G fish ticket database.

Appendix Table 19. Commercial pink salmon catch in thousands of fish by subdistrict during odd-numbered years, Lower Cook Inlet, 1959 – 1999^{a,b}.

| Location | 1959 | 1961 | 1963 | 1965 | 1967 | 1969 | 1971 | 1973 | 1975 | 1977 |
|-------------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|----------------|----------------|
| Humpy Creek | 13.2 | 34.5 | 20.6 | 6.7 | 6.9 | 0.6 | 0 | 37.3 | 242.1 | 26.4 |
| Halibut Cove and Lagoon | | 33.4 | 36.9 | 7.1 | 33.4 | 0 | 11.4 | 7.2 | 97.2 | 16.3 |
| Tutka/Barabara | 14.4 | 106.8 | 37.7 | 44.6 | 31.6 | 32.9 | 3.9 | 20.0 | 89.2 | 21.9 |
| Seldovia Bay | 4.9 | 15.1 | 1.6 | 19.2 | 11.7 | 28.8 | 27.4 | 19.4 | 429.6 | 47.6 |
| Port Graham Bay | 5.3 | 1.0 | 2.7 | 12.4 | 5.1 | 2.0 | 0.9 | 12.8 | 16.0 | 37.6 |
| Dogfish Bay | 1.6 | 0 | 0 | 0.1 | 2.3 | 0 | 10.4 | 0.3 | 0 | 5.0 |
| Port Chatham | 1.2 | 0 | 0.8 | 0 | 0 | 0 | 26.3 | 20.6 | 16.0 | 1.4 |
| Windy Bay | 3.1 | 2.2 | 0 | 5.4 | 0 | 0 | 57.3 | 68.5 | 19.1 | 173.2 |
| Rocky Bay | 2.3 | 0 | 1.4 | 0.1 | 0 | 0 | 0.1 | 0.2 | 0 | 11.6 |
| Port Dick Bay | 28.2 | 92.9 | 19.0 | 15.3 | 259.9 | 51.5 | 94.6 | 96.6 | 90.3 | 881.7 |
| Nuka Island | 33.3 | 2.0 | 0.3 | 0 | 0.1 | 0 | 25.0 | 5.2 | 31.4 | 40.6 |
| E. Nuka Bay | | | | | | | 94.6 | T | 0 | 8.7 |
| Resurrection Bay | 8.4 | 0 | 0 | 0 | 1.2 | 0 | 0 | 0 | 0 | 0 |
| Bruin Bay | 0 | 0 | 12.3 | 0.9 | 2.1 | 0 | 11.7 | 0 | 0 | 6.2 |
| Rocky/Ursus Coves | 3.7 | 2.7 | 44.2 | 0 | 13.0 | 52.8 | 16.4 | 7.9 | 0 | 0 |
| Iniskin/Cottonwood Bays | 1.5 | 3.3 | 21.8 | 0 | 0.1 | 26.0 | 0 | 4.7 | 0 | 0.1 |
| Miscellaneous | 3.6 | 9.5 | 4.3 | 3.8 | 8.1 | 7.8 | 12.9 | 6.7 | 33.4 | 15.8 |
| Total | 124.7 | 303.4 | 203.6 | 115.6 | 375.5 | 202.4 | 392.9 | 307.4 | 1,063.3 | 1,293.9 |

| Location | 1979 | 1981 | 1983 | 1985 | 1987 | 1989 | 1991 | 1993 | 1995 | 1997 |
|-------------------------|----------------|----------------|--------------|----------------|--------------|----------------|--------------|--------------|----------------|----------------|
| Humpy Creek | 277.0 | 239.9 | 8.1 | 5.6 | 0 | 91.4 | 0 | 0.2 | 13.7 | 0 |
| Halibut Cove and Lagoon | 27.1 | 11.1 | 18.8 | 5.9 | 30.5 | 254.4 | 91.1 | 100.2 | 1.9 | 2.6 |
| China Pool ^c | | | | | | 8.5 | 135.7 | 50.6 | 12.9 | 14.5 |
| Tutka/Barabara | 416.8 | 1,026.8 | 616.0 | 491.2 | 56.5 | 632.1 | 117.6 | 539.4 | 2,428.5 | 2,511.2 |
| Seldovia Bay | 140.8 | 126.4 | 43.3 | 3.8 | 1.2 | 1.1 | 0.3 | 2.4 | 8.2 | 12.3 |
| Port Graham Bay | 90.0 | 31.1 | 2.4 | 3.7 | 0.7 | 0 | 0 | 0 | 0 | 132.2 |
| Dogfish Bay | 7.4 | 22.9 | 0.2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Port Chatham | 174.4 | 47.6 | 3.3 | 7.0 | 0 | 9.7 | 7.5 | 14.7 | 17.6 | 0 |
| Windy Bay | 552.7 | 82.9 | 0 | 4.8 | 0 | 0 | 49.1 | 43.4 | 111.2 | 93.2 |
| Rocky Bay | 122.2 | 16.5 | 1.3 | 0 | 0 | 0 | 0 | 0 | 27.5 | 0 |
| Port Dick Bay | 964.8 | 1,140.9 | 140.0 | 455.6 | 3.0 | 0 | 289.7 | 26.6 | 0 | 0.6 |
| Nuka Island | 87.2 | 244.9 | 30.2 | 9.6 | 0 | 0 | 10.6 | 51.9 | 6.0 | 33.3 |
| E. Nuka Bay | 0.9 | 121.0 | 18.1 | 141.2 | 20.9 | 43.0 | T | 13.8 | 21.4 | 1.3 |
| Resurrection Bay | 0 | 32.6 | 27.1 | 74.6 | 11.8 | 0 | 0 | 0.7 | 0 | 0 |
| Bruin Bay | 40.3 | 51.9 | 0.3 | 0 | 1.2 | 202.8 | 45.1 | 0.1 | 104.8 | 0.3 |
| Rocky/Ursus Coves | 14.4 | 14.1 | 0 | 0 | 69.4 | 53.8 | 0 | 0 | 58.0 | 0 |
| Iniskin/Cottonwood Bays | 0.2 | 0 | 0.3 | 0 | 0.2 | 0 | 0 | 0 | 0 | 0 |
| Miscellaneous | 74.7 | 68.8 | 18.2 | 26.7 | 6.0 | 0.1 | 82.0 | 22.8 | 36.8 | 12.9 |
| Total | 2,990.9 | 3,279.2 | 927.6 | 1,229.7 | 201.4 | 1,296.9 | 828.7 | 868.8 | 2,848.5 | 2,814.4 |

- continued -

Appendix Table 19. (page 2 of 2)

| Location | 1999 | 2001 | 2003 | 2005 | 2007 | 2009 | 2011 | 2013 | 2015 | 2017 |
|-------------------------|----------------|------|------|------|------|------|------|------|------|------|
| Humpy Creek | 0 | | | | | | | | | |
| Halibut Cove and Lagoon | 3.4 | | | | | | | | | |
| China Poot ^c | 19.6 | | | | | | | | | |
| Tutka/Barabara | 1,080.8 | | | | | | | | | |
| Seldovia Bay | 1.5 | | | | | | | | | |
| Port Graham Bay | 0 | | | | | | | | | |
| Dogfish Bay | 0 | | | | | | | | | |
| Port Chatham | 0 | | | | | | | | | |
| Windy Bay | 0 | | | | | | | | | |
| Rocky Bay | 0 | | | | | | | | | |
| Port Dick Bay | 0 | | | | | | | | | |
| Nuka Island | 0 | | | | | | | | | |
| E. Nuka Bay | 32.5 | | | | | | | | | |
| Resurrection Bay | 0 | | | | | | | | | |
| Bruin Bay | 0.8 | | | | | | | | | |
| Rocky/Ursus Coves | 0 | | | | | | | | | |
| Iniskin/Cottonwood Bays | 0 | | | | | | | | | |
| Miscellaneous | 1.9 | | | | | | | | | |
| Total | 1,140.5 | | | | | | | | | |

^a Data source: ADF&G fish ticket database.

^b "T" denotes trace, less than 50 fish harvested

^c China Poot Subdistrict, which includes China Poot, Neptune, and Peterson Bays, was part of Halibut Cove Subdistrict prior to 1988.

Appendix Table 20. Commercial pink salmon catch in thousands of fish by subdistrict during even-numbered years, Lower Cook Inlet, 1960 - 1998^{a,b}.

| Location | 1960 | 1962 | 1964 | 1966 | 1968 | 1970 | 1972 | 1974 | 1976 | 1978 |
|-------------------------|--------------|----------------|----------------|--------------|--------------|--------------|-------------|-------------|--------------|--------------|
| Humpy Creek | 51.0 | 73.9 | 53.5 | 24.6 | 2.6 | 85.2 | 1.7 | 33.3 | 3.3 | 16.3 |
| Halibut Cove and Lagoon | 20.7 | 35.5 | 28.9 | 16.0 | 41.3 | 28.9 | 0.4 | 2.2 | 69.8 | 27.8 |
| Tutka/Barabara | 87.6 | 279.5 | 100.9 | 53.5 | 26.9 | 43.9 | 5.2 | 5.5 | 18.0 | 167.9 |
| Seldovia Bay | 42.6 | 142.8 | 37.4 | 44.1 | 23.6 | 29.0 | 0.2 | 3.5 | 3.0 | 35.8 |
| Port Graham Bay | 7.1 | 18.1 | 38.4 | 5.1 | 23.0 | 19.6 | 0.9 | 2.7 | 1.3 | 1.8 |
| Dogfish Bay | 1.8 | 1.4 | 0.1 | 7.1 | 0 | 9.8 | 0.3 | 0 | 0 | 0.3 |
| Port Chatham | 15.7 | 102.2 | 67.1 | 6.7 | 10.0 | 1.9 | 0 | 0 | 0 | 0 |
| Windy Bay | 29.2 | 85.5 | 68.6 | 20.1 | 3.4 | 0.8 | 0 | 0 | 0 | 0 |
| Rocky Bay | 17.0 | 225.9 | 53.2 | 0 | 10.8 | 36.8 | 0 | 0 | 0 | 0 |
| Port Dick Bay | 257.4 | 1,118.3 | 526.3 | 296.8 | 55.0 | 336.5 | 0 | 0.6 | 0 | 63.6 |
| Nuka Island | 26.6 | 129.8 | 23.8 | 0 | 90.2 | 48.4 | 0 | 0 | 0 | 0 |
| E. Nuka Bay | | | | | | | 0.3 | T | 0.1 | 3.3 |
| Resurrection Bay | 5.8 | 0.1 | 0.3 | 0 | 37.4 | 40.2 | 18.2 | 0 | 35.4 | 29.7 |
| Bruin Bay | 2.6 | 0 | 0 | 0 | 126.2 | 10.2 | 0 | 0 | 0 | 0 |
| Rocky/Ursus Coves | 6.6 | 3.2 | 13.5 | 2.9 | 18.0 | 7.5 | 0 | 0 | 0 | 0.1 |
| Iniskin/Cottonwood Bays | 2.1 | 3.2 | 4.3 | 0 | 9.9 | 3.5 | 0 | 0 | 0.1 | 0.1 |
| Miscellaneous | 37.8 | 28.9 | 39.1 | 102.3 | 107.1 | 14.0 | 1.5 | 2.8 | 5.4 | 5.9 |
| Total | 611.6 | 2,248.3 | 1,055.4 | 579.2 | 585.4 | 716.2 | 28.7 | 50.6 | 136.4 | 352.6 |

| Location | 1980 | 1982 | 1984 | 1986 | 1988 | 1990 | 1992 | 1994 | 1996 | 1998 |
|-------------------------|--------------|--------------|--------------|----------------|--------------|--------------|--------------|----------------|--------------|----------------|
| Humpy Creek | 48.6 | 4.9 | 53.5 | 116.7 | 0 | 0 | 0 | 0 | 0 | 0 |
| Halibut Cove and Lagoon | 4.7 | 1.0 | 10.9 | 14.0 | 106.8 | 91.0 | 58.4 | 105.6 | 2.3 | 2.4 |
| China Poot ^c | | | | | 5.4 | 46.1 | 35.7 | 24.2 | 8.2 | 3.3 |
| Tutka/Barabara | 312.5 | 184.9 | 262.0 | 400.2 | 723.9 | 37.4 | 320.9 | 1,454.5 | 428.2 | 1,300.6 |
| Seldovia Bay | 61.7 | 70.3 | 2.2 | 2.8 | 5.5 | 3.6 | 1.9 | 5.4 | 4.1 | 7.4 |
| Port Graham Bay | 17.7 | 34.8 | 3.4 | 4.7 | 0.1 | 0 | 0 | 0 | 0.8 | 0.6 |
| Dogfish Bay | 4.7 | 1.7 | 0.1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Port Chatham | 1.8 | 12.6 | 0 | 0 | 0 | 22.1 | 0 | 0 | 0 | 9.4 |
| Windy Bay | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Rocky Bay | 1.4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 35.0 |
| Port Dick Bay | 133.3 | 44.0 | 84.6 | 304.0 | 5.9 | 169.1 | 0.1 | 1.6 | 0 | 2.4 |
| Nuka Island | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 41.1 |
| E. Nuka Bay | 12.4 | 8.7 | 4.4 | 97.8 | 0.1 | 0.2 | 0 | 11.6 | 7.2 | 14.2 |
| Resurrection Bay | 155.8 | 137.4 | 122.3 | 36.5 | 0.5 | 0 | 0 | T | T | 0 |
| Bruin Bay | 100.8 | 13.3 | 125.2 | 349.7 | 5.0 | 0.4 | 1.9 | T | T | 1.8 |
| Rocky/Ursus Coves | 0 | 20.2 | 8.5 | 71.1 | 49.9 | 0 | 0.3 | 0 | 0 | 0 |
| Iniskin/Cottonwood Bays | 0.1 | 0.4 | 0.4 | 0.2 | 1.3 | 0 | T | 0 | 0 | 0 |
| Miscellaneous | 14.4 | 17.4 | 23.1 | 10.6 | 16.9 | 13.8 | 60.6 | 45.0 | 0.7 | 39.6 |
| Total | 689.7 | 551.6 | 700.6 | 1,408.3 | 921.3 | 383.7 | 479.8 | 1,647.9 | 451.5 | 1,457.8 |

^a Data source: ADF&G fish ticket database.

^b "T" denotes trace, less than 50 fish harvested.

^c China Poot Subdistrict, including Neptune Bay, was part of Halibut Cove Subdistrict prior to 1988.

Appendix Table 21. Commercial chum salmon catch in numbers of fish by district, Lower Cook Inlet, 1979 - 1999^a.

| Year | Southern | Outer | Kamishak | Eastern | Total |
|-----------------|----------|---------|----------|---------|---------|
| 1979 | 8,221 | 180,558 | 29,711 | 0 | 218,490 |
| 1980 | 4,605 | 32,246 | 35,921 | 720 | 73,492 |
| 1981 | 20,920 | 238,393 | 73,501 | 3,279 | 336,093 |
| 1982 | 18,466 | 63,075 | 108,946 | 7,698 | 198,185 |
| 1983 | 14,281 | 27,203 | 142,901 | 7,934 | 192,319 |
| 1984 | 8,065 | 3,204 | 70,736 | 10,535 | 92,540 |
| 1985 | 5,513 | 11,844 | 8,139 | 5,144 | 30,640 |
| 1986 | 5,560 | 11,701 | 61,670 | 3,757 | 82,688 |
| 1987 | 5,030 | 28,663 | 108,412 | 14,913 | 157,018 |
| 1988 | 7,742 | 71,202 | 218,299 | 24,668 | 321,911 |
| 1989 | 3,141 | 43 | 7,809 | 312 | 11,305 |
| 1990 | 2,433 | 614 | 3,597 | 307 | 6,951 |
| 1991 | 1,962 | 14,337 | 7,853 | 80 | 24,232 |
| 1992 | 1,885 | 181 | 20,051 | 86 | 22,203 |
| 1993 | 2,788 | 970 | 600 | 9 | 4,367 |
| 1994 | 2,631 | 32 | 14 | 2,792 | 5,469 |
| 1995 | 4,530 | 474 | 10,302 | 330 | 15,636 |
| 1996 | 3,511 | 3 | 27 | 223 | 3,764 |
| 1997 | 4,260 | 1,575 | 7 | 66 | 5,908 |
| 1998 | 3,956 | 611 | 29 | 51 | 4,647 |
| 1999 | 4,624 | 2,062 | 23 | 1,232 | 7,941 |
| 20-Year Avg. | 6,553 | 35,277 | 47,858 | 4,148 | 93,836 |
| 1979-88 Avg. | 9,619 | 61,611 | 68,861 | 5,408 | 145,498 |
| 1989-98 Avg. | 3,488 | 8,943 | 26,856 | 2,887 | 42,175 |
| 1999 % of Total | 85.13% | 13.15% | 0.62% | 1.10% | 100.00% |

^a Data source: ADF&G fish ticket database.

Appendix Table 22. Commercial chum salmon catch in thousands of fish by subdistrict, Lower Cook Inlet, 1959 – 1999¹¹.

| Location | 1959 | 1960 | 1961 | 1962 | 1963 | 1964 | 1965 | 1966 | 1967 | 1968 | 1969 | 1970 | 1971 |
|--------------------|-------|-------|------|-------|-------|-------|------|-------|------|------|------|-------|-------|
| Tutka Bay | 0.1 | 2.4 | 1.8 | 2.9 | 2.4 | 5.6 | 1.1 | 3.9 | 4.0 | 1.3 | 0.7 | 1.6 | 0.5 |
| Port Graham | 2.3 | 1.8 | 0.5 | 4.0 | 3.8 | 2.1 | 0.9 | 5.3 | 3.0 | 2.3 | 1.3 | 4.8 | 2.0 |
| Dogfish Bay | 4.9 | 0.4 | 0.1 | 0 | 0.2 | 0 | 0 | 7.0 | 15.3 | 0.1 | 0 | 50.9 | 114.5 |
| Port Chatham | 1.0 | 2.5 | 0 | 2.8 | 4.3 | 5.2 | 0 | 17.8 | 0 | 1.0 | 0 | 0.1 | 2.4 |
| Rocky/Windy Bays | 14.9 | 6.4 | 2.2 | 8.5 | 0.3 | 33.8 | 8.1 | 1.7 | 0 | 0.5 | 0 | 39.4 | 1.4 |
| Port Dick | 42.4 | 51.0 | 36.8 | 112.0 | 110.8 | 227.4 | 14.2 | 60.9 | 36.0 | 10.9 | 5.4 | 41.2 | 0.7 |
| Nuka Bay | 1.7 | 8.4 | 1.7 | 0.5 | 1.5 | 0 | 0 | 0 | 1.5 | 6.9 | 0 | 5.9 | 0.1 |
| Resurrection Bay | 0.1 | 0.5 | 0 | 0 | 0 | 0 | 0 | 0 | 0.1 | 0.7 | 0 | 0.6 | 0.4 |
| Douglas River | 0.2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Kamishak River | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3.7 | 0.4 | 0 | 0 |
| McNeil River | 0 | 0.4 | 0 | 0 | 0 | 2.7 | 0.90 | 0 | 0.4 | 8.3 | 4.4 | 1.9 | 0 |
| Bruin Bay | 0 | 0.3 | 0.5 | 0 | 0.1 | 0 | 0.4 | 0 | 1.0 | 7.5 | 0 | 12.8 | 1.6 |
| Ursus/Rocky Coves | 8.5 | 8.6 | 1.8 | 1.1 | 2.8 | 1.2 | 0 | 4.0 | 2.9 | 1.0 | 3.6 | 8.9 | 10.3 |
| Cottonwood/Iniskin | 12.1 | 33.4 | 10.2 | 41.7 | 10.9 | 10.9 | 0 | 0 | 19.0 | 25.5 | 44.4 | 71.9 | 14.5 |
| Miscellaneous | 22.6 | 0 | 0 | 5.8 | 1.4 | 1.4 | 2.5 | 28.5 | 2.2 | 5.4 | 1.0 | 2.4 | 0.2 |
| Totals | 110.8 | 116.1 | 55.6 | 179.3 | 138.5 | 323.3 | 28.1 | 129.1 | 85.4 | 75.1 | 61.2 | 242.4 | 148.6 |

| Location | 1972 | 1973 | 1974 | 1975 | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 |
|--------------------|------|-------|------|------|------|-------|------|-------|------|-------|-------|-------|------|
| Tutka Bay | 1.3 | 0.8 | 1.4 | 2.0 | 0.9 | 0.8 | 2.6 | 2.7 | 1.8 | 7.9 | 8.3 | 9.9 | 3.4 |
| Port Graham | 3.2 | 2.6 | 1.0 | 2.2 | 0.5 | 5.0 | 2.4 | 4.3 | 2.5 | 11.2 | 7.4 | 1.7 | 3.6 |
| Dogfish Bay | 41.1 | 0.4 | 0 | 0 | 0 | 9.4 | 0 | 8.5 | 2.1 | 71.8 | 15.6 | 2.8 | 1.1 |
| Port Chatham | 0 | 0.4 | 0 | 0.6 | 0 | 0.1 | 0 | 1.7 | 1.3 | 59.6 | 16.2 | 2.1 | 0 |
| Rocky/Windy Bays | 0 | 0.9 | 0 | 0.3 | 0 | 17.7 | 0 | 76.7 | 2.1 | 7.4 | 0 | 3.2 | 0 |
| Port Dick | 0 | 33.4 | 8.1 | 6.8 | 0 | 25.6 | 10.3 | 79.0 | 19.0 | 85.8 | 30.3 | 18.0 | 1.9 |
| Nuka Bay | 2.3 | 40.8 | 3.9 | 3.6 | 0.4 | 17.4 | 0.4 | 14.7 | 7.8 | 3.8 | 0.9 | 0.8 | 0.2 |
| Resurrection Bay | 0.7 | 0 | 0 | 0 | 0 | 0 | 0.1 | 0 | 0.7 | 2.4 | 7.7 | 6.9 | 3.0 |
| Douglas River | 0 | 0 | 0 | 0.1 | 7.1 | 4.0 | 2.9 | 0.7 | 10.1 | 46.7 | 37.1 | 27.2 | 9.2 |
| Kamishak River | 2.4 | 0 | 1.8 | 0 | 10.5 | 0 | 23.9 | 17.8 | 2.8 | 8.6 | 9.2 | 23.9 | 16.2 |
| McNeil River | 2.3 | 0 | 2.0 | 0 | 16.9 | 38.5 | 4.9 | 6.5 | 6.3 | 11.6 | 32.6 | 67.9 | 12.0 |
| Bruin Bay | 1.8 | 0 | 0.7 | 0 | 0 | 0 | 0 | 4.0 | 11.0 | 1.7 | 1.3 | 2.6 | 5.9 |
| Ursus/Rocky Coves | 0.2 | 5.7 | 0 | 2.0 | 2.8 | 7.8 | 1.9 | 0.5 | 0.3 | 1.5 | 13.5 | 0 | 3.7 |
| Cottonwood/Iniskin | 19.7 | 29.9 | 0 | 2.8 | 11.5 | 15.3 | 14.9 | 0.2 | 5.4 | 3.5 | 21.6 | 21.4 | 23.0 |
| Miscellaneous | 0.5 | 0.6 | 0.3 | 1.2 | 0.2 | 4.2 | 9.2 | 1.2 | 0.4 | 2.6 | 3.5 | 3.9 | 9.3 |
| Totals | 75.5 | 115.5 | 19.2 | 21.6 | 50.8 | 145.8 | 73.5 | 218.5 | 73.5 | 336.1 | 198.0 | 192.3 | 92.5 |

| Location | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 |
|--------------------|------|------|-------|-------|------|------|------|------|------|------|------|------|------|
| Tutka Bay | 3.2 | 3.9 | 3.9 | 4.7 | 2.5 | 4.5 | 0.8 | 0.6 | 0.9 | 0.8 | 1.6 | 1.0 | 1.1 |
| Port Graham | 1.3 | 0.8 | 0.4 | 1.2 | 0 | 0 | 0 | 0 | 0 | 0 | 0.7 | 0.7 | 2.0 |
| Dogfish Bay | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Port Chatham | 1.3 | 0 | 0 | 0 | 0 | 0.1 | 0.1 | 0 | 0.1 | 0 | 0 | 0 | 0 |
| Rocky/Windy Bays | 0 | 0 | 0 | 0 | 0 | 0 | 0.5 | 0 | 0.1 | 0 | 0.4 | 0 | 1.6 |
| Port Dick | 9.6 | 10.4 | 27.1 | 64.4 | 0 | 0.5 | 13.7 | 0.2 | 0.7 | 0 | 0 | 0 | 0 |
| Nuka Bay | 0.8 | 1.3 | 1.5 | 8.8 | 0 | 0 | 0 | 0 | 0 | 0 | 0.1 | 0 | 0 |
| Resurrection Bay | 3.0 | 3.5 | 13.9 | 23.9 | 0 | 0 | 0 | 0 | 0 | 2.5 | 0.3 | 0.2 | 0 |
| Douglas River | 8.0 | 11.6 | 23.7 | 24.8 | 0 | 0.1 | 3.0 | 12.5 | 0 | 0 | 0.7 | 0 | 0 |
| Kamishak River | 0.1 | 0.1 | 24.6 | 26.7 | 0 | 0 | 0.7 | 1.5 | 0 | 0 | 0.1 | 0 | 0 |
| McNeil River | 0 | 13.7 | 32.9 | 104.0 | 0.1 | 0.1 | 0.1 | 2.0 | 0.4 | 0 | 0 | 0 | 0 |
| Bruin Bay | 0 | 5.4 | 0.1 | 2.8 | 4.4 | 10.1 | 2.6 | 0.8 | 0 | 0 | 4.9 | 0 | 0 |
| Ursus/Rocky Coves | 0 | 22.1 | 17.2 | 20.7 | 3.4 | 0 | 0 | 2.7 | 0 | 0 | 2.2 | 0 | 0 |
| Cottonwood/Iniskin | 0 | 8.8 | 9.7 | 39.2 | 0 | 0 | 1.0 | 0.2 | 0 | 0 | 2.3 | 0 | 0 |
| Miscellaneous | 3.3 | 1.1 | 1.9 | 2.7 | 10.9 | 4.7 | 11.7 | 1.5 | 2.1 | 2.1 | 2.3 | 1.9 | 1.2 |
| Totals | 30.6 | 82.7 | 157.0 | 321.9 | 11.3 | 7.0 | 24.2 | 22.2 | 4.4 | 5.5 | 15.6 | 3.8 | 5.9 |

- continued -

Appendix Table 22. (page 2 of 2)

| Location | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|--------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Tulka Bay | 0.9 | 1.5 | | | | | | | | | | | |
| Port Graham | 0.8 | 0 | | | | | | | | | | | |
| Dogfish Bay | 0 | 0 | | | | | | | | | | | |
| Port Chatham | 0.1 | 0 | | | | | | | | | | | |
| Rocky/Windy Bays | 0.3 | 0 | | | | | | | | | | | |
| Port Dick | 0.1 | 0 | | | | | | | | | | | |
| Nuka Bay | T | 2.1 | | | | | | | | | | | |
| Resurrection Bay | 0 | 0 | | | | | | | | | | | |
| Douglas River | 0 | 0 | | | | | | | | | | | |
| Kamishak River | 0 | 0 | | | | | | | | | | | |
| McNeill River | 0 | 0 | | | | | | | | | | | |
| Bruin Bay | T | T | | | | | | | | | | | |
| Ursus/Rocky Coves | 0 | 0 | | | | | | | | | | | |
| Cottonwood/Iniskin | 0 | 0 | | | | | | | | | | | |
| Miscellaneous | 2.3 | 4.4 | | | | | | | | | | | |
| Totals | 4.6 | 7.9 | | | | | | | | | | | |

^a Data source: ADF&G fish ticket database.

^b "T" denotes trace, less than 50 fish harvested.

Appendix Table 23. Estimated sockeye salmon escapements in thousands of fish for the major spawning systems of Lower Cook Inlet, 1979 - 1999^a.

| Year | English Bay | Delight Lake | Desire Lake | Bear Lake ^{b,c} | Aialik Lake | Mikfik Lake | Chenik Lake | Amakd. Creek | Kamish. Rivers | Douglas River | Total |
|-----------------|-------------------|-------------------|-------------------|--------------------------|-------------|-------------|-------------------|--------------|----------------|---------------|---------|
| 1979 | 4.4 | 8.0 | 12.0 | 0.0 | 5.0 | 6.0 | 0.0 | 1.0 | | ^d | 36.4 |
| 1980 | 12.0 | 10.0 | 17.0 | 1.5 | 6.6 | 6.5 | 3.5 | 2.6 | ^d | 0.4 | 60.1 |
| 1981 | 10.5 | 7.3 | 12.0 | 0.7 | 1.8 | 5.3 | 2.5 | 1.9 | ^d | 0.2 | 42.2 |
| 1982 | 20.0 | 25.0 | 18.0 | 0.5 | 22.4 | 35.0 | 8.0 | 3.2 | 1.0 | 4.2 | 137.3 |
| 1983 | 12.0 | 7.0 | 12.0 | 0.7 | 20.0 | 7.0 | 11.0 | 1.2 | 0.4 | 0.5 | 71.8 |
| 1984 | 11.1 | 10.5 | 15.0 | 0.5 | 22.0 | 6.0 | 13.0 | 1.4 | 0.1 | 0.0 | 79.6 |
| 1985 | 5.0 | 26.0 | 18.0 | 1.1 | 8.0 | 20.0 | 3.5 | 0.9 | 0.8 | 0.0 | 83.3 |
| 1986 | 2.8 | 13.0 | 10.0 | 0.8 | 7.6 | 7.8 | 7.0 | 1.9 | 5.0 | 0.2 | 56.1 |
| 1987 | 7.0 | 10.5 | 13.4 | 0.3 | 9.2 | 9.0 | 10.0 | 1.1 | ^d | 0.1 | 60.6 |
| 1988 | 2.5 | 1.2 | 9.0 | 0.1 | 13.0 | 10.1 | 9.0 | 0.4 | 0.5 | 0.0 | 45.8 |
| 1989 | 4.5 | 7.7 | 9.0 | 0.1 | 6.5 | 11.5 | 12.0 ^c | 1.2 | 0.5 | 0.6 | 53.6 |
| 1990 | 3.3 | 5.2 | 9.5 | 0.1 | 5.7 | 8.8 | 17.0 | 1.8 | 0.2 | 0.6 | 52.2 |
| 1991 | 7.0 | 4.1 | 8.2 | 0.7 | 3.7 | 9.7 | 10.2 ^c | 1.9 | 0.7 | ^d | 46.2 |
| 1992 | 6.4 | 5.9 | 11.9 | 1.9 | 2.5 | 7.8 | 9.3 ^c | 1.9 | 4.9 | 0.2 | 52.7 |
| 1993 | 8.9 | 5.6 | 11.0 | 5.0 | 3.0 | 6.4 | 4.0 ^c | 2.0 | 4.1 | ^d | 50.0 |
| 1994 | 13.8 ^c | 5.6 | 10.5 | 8.6 | 7.3 | 9.5 | 0.8 ^c | 0.8 | ^d | ^d | 56.9 |
| 1995 | 22.5 ^c | 15.8 | 15.8 | 8.3 | 2.6 | 10.1 | 1.1 ^c | 2.4 | ^d | ^d | 78.6 |
| 1996 | 12.4 ^c | 7.7 | 9.4 | 8.0 | 3.5 | 10.5 | 3.0 ^c | 2.9 | 1.8 | 0.6 | 55.8 |
| 1997 | 15.4 ^c | 27.8 ^c | 14.7 ^c | 7.9 | 11.4 | 8.5 | 2.3 ^c | 1.5 | ^d | ^d | 89.5 |
| 1998 | 15.4 ^c | 9.2 ^c | 7.9 | 8.4 | 4.9 | 12.6 | 1.9 | 4.1 | ^d | ^d | 63.1 |
| 1999 | 15.8 ^c | 17.0 ^d | 14.6 | 7.8 | 3.8 | 15.7 | 2.9 | 8.8 | 2.2 | 0.4 | 89.0 |
| 20-Year Average | 10.7 | 12.2 | 2.8 | 8.3 | 10.2 | 6.5 | 1.8 | 1.7 | 0.6 | 64.5 | 10.7 |
| 1979-88 Average | 11.9 | 13.6 | 0.6 | 11.6 | 11.3 | 6.8 | 1.6 | 1.3 | 0.6 | 67.9 | 11.9 |
| 1989-98 Average | 9.5 | 10.8 | 4.9 | 5.1 | 9.1 | 6.2 | 2.1 | 2.0 | 0.5 | 61.0 | 9.5 |
| Esc. Goal | 15 | 10 | 10 | 5-8 | 2.5-5 | 5-7 | 10 | 1 | ^a | ^a | 58.5-66 |

^a Unless otherwise noted, estimated escapements are either peak aerial survey counts or adjusted aerial survey counts based on survey conditions and time of surveys.

^b Limited by Bear Lake Management Plan since 1971.

^c Weir counts.

^d Combination of weir counts and video camera estimates.

^e No formal escapement goal established.

Appendix Table 24. Estimated pink salmon escapements in thousands of fish for the major spawning systems of Lower Cook Inlet, 1960 – 1999^a.

| Location | Y E A R | | | | | | | | | | |
|-------------------------|---------|-------|---------|-------|-------|-------|-------|-------|-------|-------|-------|
| | 1960 | 1961 | 1962 | 1963 | 1964 | 1965 | 1966 | 1967 | 1968 | 1969 | 1970 |
| Humpy Creek | 10.0 | 22.6 | 58.0 | 34.7 | 18.5 | 28.0 | 30.0 | 25.0 | 24.7 | 5.4 | 55.2 |
| China Poot Creek | 9.0 | 2.0 | 26.0 | — | — | — | — | 2.5 | 6.0 | 0.2 | 11.5 |
| Tutka Lagoon Creek | 15.0 | 15.0 | 30.0 | 10.0 | 20.0 | 20.0 | 12.0 | 7.0 | 7.9 | 6.5 | 6.5 |
| Barabara Creek | 2.0 | 0.1 | 1.5 | 0.1 | — | — | 5.0 | — | 2.0 | 0.9 | 0.4 |
| Seldovia River | 25.0 | 25.0 | 50.0 | 13.0 | 60.0 | 30.0 | 86.0 | 55.0 | 53.2 | 60.0 | 23.0 |
| Port Graham River | 15.0 | 5.0 | 50.0 | 2.0 | 16.0 | 1.5 | 24.0 | 2.0 | 24.4 | 4.0 | 16.6 |
| Dogfish Lagoon | 2.0 | — | 3.0 | — | — | — | — | — | — | — | — |
| Port Chatham Creeks | 4.0 | 7.0 | 7.0 | — | — | — | 10.0 | — | — | — | 3.0 |
| Windy Right Creek | 8.0 | 10.0 | 12.5 | 4.8 | 6.2 | 2.0 | 7.0 | 6.0 | 2.8 | 3.2 | 2.1 |
| Windy Left Creek | 8.0 | 5.0 | 12.5 | 4.5 | 7.7 | 11.0 | 7.0 | 6.0 | 5.9 | 23.0 | 13.0 |
| Rocky River | 130.0 | 2.0 | 200.0 | 12.0 | 80.0 | 0.3 | 44.0 | 1.1 | 43.1 | 1.0 | 32.0 |
| Port Dick Creek | 35.0 | 14.0 | 40.0 | 18.0 | 31.5 | 50.0 | 35.0 | 20.0 | 29.0 | 12.0 | 34.5 |
| Island Creek | 23.2 | 2.0 | 15.0 | 3.6 | 30.0 | 0.5 | 7.0 | 0.5 | 4.3 | 0.1 | 5.5 |
| South Nuka Island Creek | 20.0 | 2.0 | 22.0 | 0.1 | 10.0 | — | 10.0 | — | 10.0 | 3.0 | 11.0 |
| Desire Lake Creek | — | — | 18.0 | — | 1.3 | — | — | — | — | — | — |
| James Lagoon | — | — | — | — | — | — | — | — | — | — | — |
| Aialik Lagoon | — | — | 25.0 | 0.3 | — | — | 2.0 | — | — | — | — |
| Bear Creek | 1.4 | — | 3.1 | — | 6.4 | — | — | — | 3.1 | — | — |
| Salmon Creek | — | — | — | — | — | — | — | — | — | — | — |
| Thumb Cove | — | — | — | — | — | — | — | — | — | — | — |
| Humpy Cove | — | — | — | — | — | — | — | — | — | — | — |
| Tonsina Creek | — | — | — | — | — | — | — | — | 2.9 | 0.1 | — |
| Big Kamishak River | — | — | 100.0 | 75.0 | 75.0 | — | 13.0 | — | — | — | — |
| Little Kamishak River | — | — | 100.0 | 24.0 | — | — | 28.0 | 3.5 | — | 0.5 | 2.0 |
| Amakdedori Creek | 60.0 | — | 80.0 | — | 10.0 | — | 8.0 | — | — | 1.0 | 13.0 |
| Bruin Bay River | 18.0 | — | 300.0 | 25.0 | — | — | 20.0 | 0.5 | — | 5.0 | 40.0 |
| Sunday Creek | 1.5 | — | 5.0 | 2.0 | — | — | 20.0 | — | — | 1.0 | 2.0 |
| Brown's Peak Creek | — | — | 25.0 | 10.0 | 20.0 | 10.0 | 11.0 | — | — | 2.0 | — |
| Totals | 387.1 | 111.7 | 1,181.5 | 237.2 | 392.6 | 152.3 | 379.0 | 129.0 | 220.3 | 128.9 | 261.3 |

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Appendix Table 24. (page 2 of 4)

| Location | Y E A R | | | | | | | | | | |
|-------------------------|---------|------|-------|------|-------|-------|-------|-------|-------|-------|-------|
| | 1971 | 1972 | 1973 | 1974 | 1975 | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 |
| Humpy Creek | 45.0 | 13.8 | 36.9 | 17.4 | 64.0 | 27.2 | 88.0 | 46.1 | 200.0 | 64.4 | 115.0 |
| China Foot Creek | 2.1 | 1.0 | 6.0 | 5.2 | 21.8 | 2.0 | 3.9 | 11.2 | 20.6 | 12.3 | 5.0 |
| Tutka Lagoon Creek | 16.7 | 1.5 | 6.5 | 2.6 | 17.6 | 11.5 | 14.0 | 15.0 | 10.6 | 17.3 | 21.1 |
| Barabara Creek | 4.0 | 0.6 | — | 0.2 | 22.7 | 0.2 | 5.7 | 1.4 | 10.0 | 5.8 | 16.8 |
| Seldovia River | 31.1 | 5.8 | 14.5 | 13.7 | 36.2 | 25.0 | 35.7 | 24.6 | 43.7 | 65.5 | 82.7 |
| Port Graham River | 13.2 | 2.4 | 7.0 | 2.8 | 27.3 | 6.5 | 20.8 | 6.7 | 32.7 | 40.2 | 18.4 |
| Dogfish Lagoon | 0.3 | — | 1.0 | — | 2.3 | — | 8.1 | 0.6 | 7.3 | 0.3 | 2.6 |
| Port Chatham Creeks | 15.5 | 1.0 | 5.0 | 0.2 | 7.7 | — | 14.2 | 0.3 | 20.8 | 7.7 | 11.2 |
| Windy Right Creek | 13.0 | 0.1 | 4.8 | 0.1 | 18.7 | 0.2 | 11.1 | 0.3 | 10.4 | 3.3 | 4.7 |
| Windy Left Creek | 35.4 | 0.4 | 12.9 | 0.1 | 9.7 | 0.2 | 47.3 | 1.1 | 74.8 | 10.9 | 31.3 |
| Rocky River | 1.6 | 8.2 | 2.0 | 1.5 | 4.4 | 2.7 | 36.7 | 8.2 | 38.0 | 6.4 | 25.0 |
| Port Dick Creek | 97.8 | 10.0 | 26.4 | 1.5 | 62.8 | 12.7 | 109.3 | 44.9 | 118.0 | 56.1 | 108.0 |
| Island Creek | 0.1 | 1.7 | 0.5 | 0.5 | 0.1 | — | 0.8 | 0.4 | 0.6 | 2.2 | 25.0 |
| South Nuka Island Creek | 14.0 | 0.3 | 16.0 | — | 28.0 | — | 12.0 | — | 15.0 | 0.3 | 16.0 |
| Desire Lake Creek | 30.0 | 0.3 | 3.0 | — | 0.4 | 0.6 | 0.8 | 1.0 | 3.0 | 16.0 | 6.0 |
| James Lagoon | — | — | — | — | — | — | — | — | — | 4.6 | 14.0 |
| Aialik Lagoon | — | — | — | 0.1 | — | 0.4 | — | — | — | — | — |
| Bear Creek | — | 0.5 | — | 4.9 | — | 10.0 | — | 7.8 | — | 13.3 | 0.4 |
| Salmon Creek | — | — | — | — | — | 18.9 | — | 11.0 | — | 15.6 | 0.1 |
| Thumb Cove | — | — | — | 1.1 | — | 2.0 | — | 2.0 | — | 1.2 | 1.0 |
| Humpy Cove | — | — | — | 0.6 | — | 1.4 | — | 0.9 | — | 5.7 | 0.4 |
| Tonsina Creek | — | — | — | 1.4 | — | 5.7 | — | 1.5 | — | 0.7 | 0.2 |
| Big Kamishak River | — | — | 15.0 | 1.0 | — | 8.0 | — | 12.0 | 10.0 | 2.0 | — |
| Little Kamishak River | — | — | 13.0 | — | — | 6.0 | — | 0.4 | 3.5 | 0.6 | — |
| Amakdedon Creek | — | 0.2 | 3.0 | 1.0 | 5.0 | — | — | 0.9 | 6.0 | 3.8 | 1.5 |
| Bruin Bay River | 22.0 | 2.5 | 2.0 | 0.6 | 20.0 | 13.5 | 60.0 | 33.0 | 200.0 | 400.0 | 95.0 |
| Sunday Creek | 43.0 | 2.0 | 5.0 | 0.1 | 20.0 | 0.3 | 9.0 | 0.2 | 12.0 | 6.2 | 14.2 |
| Brown's Peak Creek | 8.0 | 1.2 | 3.2 | 0.1 | 10.0 | 1.2 | 13.0 | 0.9 | 15.0 | 2.3 | 17.7 |
| Totals | 392.8 | 53.5 | 183.5 | 58.7 | 378.5 | 154.8 | 488.0 | 232.4 | 897.0 | 763.6 | 610.3 |

-continued-

Appendix Table 24. (page 3 of 4)

| Location | Y E A R | | | | | | | | | | |
|-------------------------|---------|-------|-------|-------|---------|-------|-------|-------|-------|-------------------|--------------|
| | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 |
| Humpy Creek | 31.9 | 104.0 | 84.2 | 117.0 | 49.7 | 26.6 | 21.4 | 83.0 | 27.0 | 17.4 | 14.9 |
| China Poot Creek | 3.7 | 14.1 | 8.4 | 1.9 | 11.5 | 3.1 | 3.9 | 8.5 | 4.2 | 2.6 | 4.1 |
| Tutka Lagoon Creek | 18.5 | 12.9 | 10.5 | 14.0 | 13.4 | 4.8 | 11.2 | 11.9 | 38.5 | 18.8 | 23.7 |
| Barabara Creek | 2.1 | 14.8 | 1.0 | 1.6 | 1.8 | 0.3 | 0.7 | 4.5 | 3.9 | 10.9 | 2.2 |
| Seldovia River | 38.4 | 27.9 | 14.2 | 22.8 | 28.2 | 7.6 | 16.9 | 28.2 | 27.5 | 30.0 | 14.7 |
| Port Graham River | 28.9 | 4.6 | 10.8 | 28.3 | 17.5 | 3.6 | 7.9 | 19.1 | 20.1 | 29.0 | 5.4 |
| Dogfish Lagoon | 2.8 | 1.0 | 0.6 | 0.2 | 0.4 | 1.2 | 0.3 | 0.2 | 7.1 | 9.3 | ^c |
| Port Chatham Creeks | 2.0 | 3.5 | 7.8 | 8.9 | 11.5 | 10.2 | 21.0 | 31.7 | 27.8 | 23.8 | 4.3 |
| Windy Right Creek | 4.7 | 4.3 | 3.4 | 5.4 | 2.5 | 2.0 | 1.3 | 8.6 | 7.1 | 20.7 | 3.9 |
| Windy Left Creek | 4.4 | 11.9 | 2.5 | 8.9 | 2.2 | 5.6 | 3.4 | 25.2 | 7.5 | 34.5 | 8.2 |
| Rocky River | 6.6 | 18.6 | 9.0 | 12.1 | 12.0 | 4.5 | 5.4 | 10.3 | 18.6 | 26.1 | 28.4 |
| Port Dick Creek | 18.9 | 66.1 | 44.6 | 65.3 | 41.8 | 4.5 | 12.0 | 55.4 | 41.7 | 54.2 | 6.9 |
| Island Creek | 15.0 | 15.3 | 35.0 | 27.9 | 16.6 | 0.1 | 7.2 | 6.7 | 25.0 | 24.4 | 12.5 |
| South Nuka Island Creek | 0.4 | 22.2 | 0.6 | 3.6 | 7.0 | 2.8 | 1.2 | 7.3 | 13.3 | 18.4 | 8.1 |
| Desire Lake Creek | 12.0 | 8.5 | 23.0 | 82.5 | 32.0 | 11.0 | 2.5 | 47.0 | 1.0 | 1.3 | 0.4 |
| James Lagoon | 6.0 | 5.1 | 4.0 | 9.0 | 6.6 | 1.1 | 1.7 | 4.9 | 3.8 | 4.4 | 0.4 |
| Alalik Lagoon | 5.0 | 3.0 | 4.0 | 9.4 | 6.0 | 1.5 | 0.7 | 0.8 | — | — | ^c |
| Bear Creek | 7.9 | 0.8 | 7.7 | 4.1 | 14.0 | 3.5 | 0.2 | 1.7 | 4.4 | 15.4 ^b | 2.3 |
| Salmon Creek | 21.0 | 0.5 | 10.2 | 2.1 | 8.3 | 1.7 | 0.1 | 1.6 | — | ^b | 6.3 |
| Thumb Cove | 7.9 | 4.9 | 4.2 | 14.5 | 4.0 | 2.7 | 0.3 | 4.2 | — | 3.4 | 0.4 |
| Humpy Cove | 4.0 | 2.0 | 2.5 | 5.0 | 0.9 | 0.3 | 0.4 | 1.0 | 3.8 | — | ^c |
| Tonsina Creek | 7.5 | 5.4 | 6.0 | 48.2 | 11.2 | 3.4 | 0.1 | 0.5 | 1.2 | 0.3 | ^c |
| Big Kamishak River | 5.0 | — | — | — | 5.0 | — | 1.0 | — | — | — | ^c |
| Little Kamishak River | 2.2 | — | 0.1 | 1.6 | 2.0 | — | 0.5 | — | — | 0.9 | ^c |
| Amakdedori Creek | 6.3 | 0.2 | — | 1.0 | 6.0 | 0.4 | 1.0 | 2.0 | 0.1 | 0.7 | 3.2 |
| Bruin Bay River | 75.0 | 4.0 | 110.0 | 3.5 | 1,200.0 | 24.0 | 29.0 | 350.0 | 19.0 | 74.9 | 3.2 |
| Sunday Creek | 12.0 | 4.7 | 12.0 | 11.4 | 109.0 | 29.7 | 18.0 | 133.0 | 2.8 | 20.9 | 2.0 |
| Brown's Peak Creek | 3.5 | 1.7 | 8.8 | 7.0 | 28.0 | 40.2 | 17.0 | 120.0 | 1.0 | 16.7 | 5.0 |
| Totals | 353.8 | 358.0 | 423.2 | 495.2 | 1,648.9 | 196.6 | 188.3 | 843.3 | 306.1 | 455.0 | 158.4 |

-continued-

Appendix Table 24. (page 4 of 4)

| Location | Y E A R | | | | | | | | 1960-98 | Escapement |
|-------------------------|------------------|-------------------|-------------------|------------------|------------------|-------------------|------------------|------|---------|------------|
| | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | Average | Goal |
| Humpy Creek | 36.0 | 14.1 | 89.3 | 9.0 | 78.3 | 17.5 | 12.8 | | 47.6 | 25-50 |
| China Poot Creek | 1.6 | 5.7 | 2.0 | 2.8 | 2.8 | 5.7 | 0.7 | | 5.4 | 5 |
| Tutka Lagoon Creek | 27.4 | 14.6 | 15.9 | 3.5 | 45.0 | 17.5 | 27.9 | | 18.1 | 6-10 |
| Barabara Creek | 11.9 | 4.5 | 10.8 | 2.4 | 12.5 | 2.8 | 3.9 | | 4.6 | 18-24 |
| Seldovia River | 43.4 | 24.4 | 48.5 | 17.8 | 39.1 | 31.5 | 12.2 | | 33.3 | 25-35 |
| Port Graham River | 12.8 | 7.6 | 10.0 | 7.0 | 12.5 | 12.6 | 9.7 | | 14.7 | 20-40 |
| Dogfish Lagoon | 0.3 | 1.3 | 13.3 | 2.3 | 20.0 | 6.7 | 12.4 | | 3.6 | - |
| Port Chatham Creeks | 22.2 | 3.3 | 14.0 | 6.6 | 42.7 | 22.2 | 10.7 | | 11.9 | 10-15 |
| Windy Right Creek | 13.6 | 2.2 | 11.4 | 9.9 | 13.9 | 19.5 | 5.2 | | 8.8 | 10 |
| Windy Left Creek | 25.9 | 3.0 | 31.6 | 2.5 | 64.6 | 12.9 | 24.0 | | 14.9 | 30-50 |
| Rocky River | 70.0 | 17.1 | 56.3 | 80.1 | 48.1 | 165.0 | 17.2 | | 33.6 | 50 |
| Port Dick Creek | 37.0 | 18.1 | 6.6 | 23.2 | 36.9 | 59.1 | 8.3 | | 39.8 | 20-100 |
| Island Creek | 12.1 | 28.3 | 10.6 | 40.1 | 71.1 | 83.6 | 8.6 | | 14.6 | 12-18 |
| South Nuka Island Creek | 34.3 | 1.4 | 6.2 | 6.8 | 9.3 | 14.0 | 2.4 | | 10.1 | 10 |
| Desire Lake Creek | 19.3 | — | — | — | 6.2 | 6.2 | 6.8 | | 12.0 | 10-20 |
| James Lagoon | 3.3 | 0.8 | 0.6 | — | — | — | — | | 4.4 | 5-10 |
| Alalik Lagoon | — | — | 1.1 | — | — | 0.4 | 0.9 | | 4.0 | 5 |
| Bear Creek | 6.6 ^b | 34.8 ^b | 38.6 ^b | 8.0 ^b | 6.3 ^b | 13.2 ^b | 7.8 ^b | | 8.2 | 5 |
| Salmon Creek | ^b | ^b | ^b | ^b | ^b | ^b | ^b | | 7.3 | 10 |
| Thumb Cove | 5.5 | 10.8 | 9.3 | 9.5 | 4.7 | 21.0 | 9.2 | | 8.5 | 4 |
| Humpy Cove | 0.9 | 2.2 | 1.8 | 3.4 | 2.2 | 1.2 | 4.0 | | 2.0 | 2 |
| Tonsina Creek | 3.2 | 7.0 | 0.5 | 0.4 | 0.4 | 2.3 | 0.5 | | 4.8 | 5 |
| Big Kamishak River | — | — | — | 16.7 | — | 2.0 | 5.7 | | 22.7 | 20 |
| Little Kamishak River | — | — | — | — | — | — | 4.2 | | 11.1 | 20 |
| Amakdedori Creek | 1.7 | 0.7 | 4.5 | — | 1.7 | — | — | | 8.0 | 5 |
| Bruin Bay River | 86.4 | 5.9 | 307.3 | 27.5 | 162.7 | 134.9 | 2.9 | | 110.7 | 25-50 |
| Sunday Creek | 57.8 | 3.1 | 95.9 | 2.8 | 52.5 | 24.0 | 5.3 | | 20.7 | 10 |
| Brown's Peak Creek | 41.8 | 1.3 | 66.7 | 2.4 | 42.3 | 7.9 | 2.6 | | 17.3 | 10 |
| Totals | 574.6 | 212.1 | 882.8 | 288.7 | 775.8 | 683.7 | 305.8 | | 429.0 | 377-593 |

^a Escapement estimates are derived from periodic ground surveys with stream life factors applied, or from periodic aerial surveys. Aerial survey estimates after 1990 incorporate stream life factors; prior to 1990, aerial estimates are peak aerial survey counts adjusted for survey conditions and time of surveys.

^b Escapement figure for Bear Creek represents the combined escapement for Bear and Salmon Creeks.

^c Insufficient data for escapement estimates.

Appendix Table 25. Estimated chum salmon escapements in thousands of fish for the major spawning systems of Lower Cook Inlet, 1979 - 1999^a.

| Year | Port Graham | Dogfish Lagoon | Rocky River | Pt. Dick Head | Island Creek | Big Kamishak | Little Kamishak | McNeil River | Bruin Bay | Ursus Cove | Cotton- wood | Iniskin Bay | Total |
|-----------------|----------------|-------------------|----------------|------------------|-----------------|-----------------|--------------------|-----------------|--------------|---------------|-----------------|----------------|---------|
| 1979 | 2.2 | 8.2 | 35.0 | 4.0 | 16.8 | 15.0 | 15.0 | 8.0 | 15.0 | 5.0 | 2.5 | 4.0 | 130.7 |
| 1980 | 1.1 | 4.0 | 23.0 | 4.2 | 10.9 | 10.0 | 13.0 | 8.0 | 15.0 | 8.0 | 4.2 | 9.3 | 110.7 |
| 1981 | 4.8 | 11.5 | 12.5 | 4.1 | 17.5 | 11.0 | 6.0 | 30.0 | 10.0 | 10.0 | 9.0 | 9.0 | 135.4 |
| 1982 | 2.5 | 8.5 | 2.8 | 1.7 | 8.7 | 25.0 | 18.0 | 25.0 | 10.0 | 9.0 | 7.0 | 12.8 | 131.0 |
| 1983 | 1.9 | 5.3 | 4.0 | 4.5 | 36.2 | 25.0 | 25.0 | 48.0 | 6.5 | 7.7 | 8.3 | 12.0 | 183.4 |
| 1984 | 2.1 | 8.6 | 3.5 | 2.7 | 25.6 | 19.0 | 12.0 | 21.0 | 8.0 | 7.0 | 6.5 | 9.8 | 125.8 |
| 1985 | 0.5 | 4.9 | 2.5 | 1.0 | 8.1 | 6.0 | 4.5 | 9.5 | 2.0 | 3.0 | 3.0 | 5.0 | 51.0 |
| 1986 | 0.6 | 2.5 | 2.0 | 1.7 | 8.8 | 24.0 | 17.0 | 22.0 | 2.0 | 11.0 | 11.0 | 5.9 | 108.3 |
| 1987 | 1.5 | 2.0 | 0.2 | 8.1 | 13.2 | 12.0 | 18.0 | 26.0 | 11.0 | 8.9 | 17.0 | 5.1 | 125.0 |
| 1988 | 3.0 | 8.6 | 0.3 | 9.0 | 7.8 | 15.0 | 13.0 | 49.0 | 7.0 | 9.4 | 16.0 | 9.5 | 147.6 |
| 1989 | 1.3 | 1.8 | 1.2 | 3.3 | 4.8 | 30.0 | 12.0 | 34.0 | 8.0 | 6.3 | 8.0 | 5.9 | 116.6 |
| 1990 | 2.6 | 1.0 | 0.8 | 1.1 | 2.3 | 2.5 | 7.9 | 8.0 | 4.0 | 3.8 | 4.3 | 8.4 | 46.7 |
| 1991 | 1.1 | 3.1 | | 7.4 | 17.3 | 8.7 | 8.4 | 10.0 | 8.0 | 1.3 | 7.7 | 8.3 | 79.3 |
| 1992 | 1.4 | 0.8 | 1.7 | 5.4 | 6.7 | 4.5 | 7.1 | 19.2 | 8.5 | 1.7 | 6.1 | 3.4 | 66.5 |
| 1993 | 2.5 | 5.4 | 0.1 | 2.5 | 3.6 | 9.1 | 6.3 | 17.4 | 6.0 | 7.7 | 12.0 | 8.0 | 78.8 |
| 1994 | 5.2 | 11.3 | 1.8 | 3.5 | 8.8 | — | 9.0 | 15.0 | 8.1 | 6.2 | 10.2 | 16.9 | 96.1 |
| 1995 | 3.8 | 4.2 | 5.1 | 3.3 | 7.7 | ^b | ^b | 14.4 | 8.6 | 11.1 | 12.0 | 22.7 | 90.9 |
| 1996 | 3.7 | 6.7 | 2.0 | 2.3 | 6.9 | 11.1 | 4.4 | 16.1 | 14.9 | 7.6 | 16.1 | 7.8 | 99.6 |
| 1997 | 4.1 | 12.7 | 1.1 | 1.9 | 5.2 | — | — | 27.5 | 8.8 | 6.2 | 6.6 | 15.4 | 88.6 |
| 1998 | 5.1 | 9.8 | 0.7 | 1.8 | 3.4 | 7.1 | 9.7 | 23.5 | 9.4 | 4.6 | 2.3 | 18.6 | 96.0 |
| 1999 | 6.6 | 18.8 | 5.4 | 2.9 | 16.4 | 11.6 | 8.9 | 13.5 | 10.3 | 21.0 | 12.0 | 23.3 | 150.7 |
| 20-Year Avg. | 2.6 | 6.0 | 5.3 | 3.6 | 11.1 | 13.8 | 11.5 | 21.8 | 8.1 | 6.8 | 8.4 | 10.2 | 109.0 |
| 1979-88 Avg. | 2.0 | 6.4 | 8.6 | 3.9 | 15.4 | 16.2 | 14.2 | 24.7 | 8.5 | 8.0 | 8.5 | 6.6 | 124.9 |
| 1989-98 Avg. | 3.1 | 5.7 | 1.5 | 3.3 | 6.7 | 10.4 | 8.1 | 16.5 | 7.6 | 5.7 | 8.4 | 11.7 | 91.0 |
| Esc. goal | 4-8 | 5-10 | 20 | 4 | 10-15 | 20 | 20 | 20-40 | 5-10 | 5-10 | 10 | 10 | 133-177 |

^a Escapement estimates are derived from periodic ground surveys with stream life factors applied, or from periodic aerial surveys. Aerial survey estimates after 1990 incorporate stream life factors; prior to 1990, aerial estimates are peak aerial survey counts adjusted for survey conditions and time of surveys.

^b Insufficient data to generate escapement estimates.

Appendix Table 26. Personal use/subsistence set gillnet salmon catch in numbers of fish by species and effort, Southern District, Lower Cook Inlet, 1969 - 1999^a.

| Year | Permits Issued | Permits Returned | | Permits | | Total | | | Catch | | | Total |
|---------------|-------------------|---------------------|------|-------------|---------------|---------|---------|-------|-------|------|------------------|--------|
| | | Number | % | Did Fish | Not Fished | Chinook | Sockeye | Coho | Pink | Chum | Other | |
| 1969 | 47 | 44 | 93.6 | 35 | 9 | 0 | 9 | 752 | 38 | 0 | 17 | 816 |
| 1970 | 78 | 73 | 93.6 | 55 | 18 | 0 | 12 | 1,179 | 143 | 13 | 39 | 1,386 |
| 1971 | 112 | 95 | 84.8 | 53 | 42 | 2 | 16 | 1,549 | 44 | 7 | 20 | 1,638 |
| 1972 | 135 | 105 | 77.8 | 64 | 41 | 1 | 11 | 975 | 48 | 69 | 19 | 1,123 |
| 1973 | 143 | 128 | 89.5 | 82 | 46 | 0 | 18 | 1,304 | 84 | 40 | 9 | 1,455 |
| 1974 | 148 | 118 | 79.7 | 52 | 66 | 0 | 16 | 376 | 43 | 77 | 27 | 539 |
| 1975 | 292 | 276 | 94.5 | 221 | 55 | 4 | 47 | 1,960 | 632 | 61 | 95 | 2,799 |
| 1976 | 242 | 221 | 91.3 | 138 | 83 | 16 | 46 | 1,962 | 1,513 | 56 | 75 | 3,668 |
| 1977 | 197 | 179 | 90.9 | 137 | 42 | 12 | 46 | 2,216 | 639 | 119 | 84 | 3,116 |
| 1978 | 311 | 264 | 84.9 | 151 | 113 | 4 | 35 | 2,482 | 595 | 34 | 89 | 3,239 |
| 1979 | 437 | 401 | 91.8 | 238 | 163 | 6 | 37 | 2,118 | 2,251 | 41 | 130 | 4,583 |
| 1980 | 533 | 494 | 92.7 | 299 | 195 | 43 | 32 | 3,491 | 1,021 | 25 | 153 ^b | 4,765 |
| 1981 | 384 | 374 | 97.4 | 274 | 100 | 25 | 64 | 4,314 | 732 | 89 | 100 | 5,324 |
| 1982 | 395 | 378 | 95.7 | 267 | 71 | 39 | 46 | 7,303 | 955 | 123 | 8 | 8,474 |
| 1983 | 360 | 328 | 91.1 | 210 | 118 | 4 | 21 | 2,525 | 330 | 40 | 2 | 2,922 |
| 1984 | 390 | 346 | 88.7 | 219 | 127 | 4 | 25 | 3,666 | 821 | 87 | 25 | 4,628 |
| 1985 | 316 | 302 | 95.6 | 205 | 97 | 5 | 43 | 3,372 | 166 | 35 | 3 | 3,624 |
| 1986 | 338 | 310 | 91.7 | 247 | 63 | 7 | 68 | 3,831 | 3,132 | 56 | 0 | 7,094 |
| 1987 | 361 | 338 | 93.6 | 249 | 89 | 5 | 50 | 3,977 | 279 | 61 | 0 | 4,372 |
| 1988 | 438 | 404 | 92.2 | 287 | 117 | 14 | 60 | 4,877 | 1,422 | 75 | 0 | 6,448 |
| 1989 | 466 | 452 | 97.0 | 332 | 120 | 41 | 156 | 7,215 | 882 | 53 | 49 | 8,396 |
| 1990 | 576 | 543 | 93.9 | 420 | 123 | 12 | 200 | 8,323 | 1,846 | 69 | 0 | 10,450 |
| 1991 | 472 | 459 | 97.2 | 295 | 164 | 8 | 47 | 4,931 | 366 | 23 | 0 | 5,375 |
| 1992 | 365 | 350 | 95.9 | 239 | 111 | 5 | 63 | 2,277 | 643 | 21 | 0 | 3,009 |
| 1993 | 326 | 317 | 97.2 | 215 | 102 | 6 | 44 | 1,992 | 463 | 18 | 0 | 2,523 |
| 1994 | 286 | 284 | 99.3 | 224 | 60 | 66 | 80 | 4,097 | 1,178 | 18 | 0 | 5,439 |
| 1995 | 235 | 232 | 98.7 | 178 | 54 | 118 | 108 | 2,916 | 343 | 7 | 0 | 3,492 |
| 1996 | 299 | 293 | 98.0 | 213 | 80 | 302 | 102 | 3,347 | 1,022 | 24 | 0 | 4,797 |
| 1997 | 276 | 264 | 95.7 | 185 | 79 | 383 | 191 | 1,814 | 252 | 12 | 0 | 2,652 |
| 1998 | 227 | 214 | 94.3 | 142 | 72 | 135 | 20 | 1,461 | 167 | 5 | 0 | 1,788 |
| 1999 | 146 | 141 | 96.6 | 111 | 30 | 276 | 119 | 1,803 | 168 | 3 | 0 | 2,369 |
| 69-98 Avg. | 307 | 287 | 93.5 | 200 | 87 | 42 | 58 | 3,100 | 733 | 46 | 28 | 4,007 |

^a Figures after 1991 include information from both returned permits and inseason oral reports.

^b Steelhead trout (*Onchorhynchus mykiss*).

Appendix Table 27. Summary of personal use/subsistence salmon gillnet fishermen in the Southern District of Lower Cook Inlet (excluding the Port Graham/Nanwalek subsistence fishery and the Seldovia subsistence fishery) by area of residence, 1979 - 1999.

| Year | Homer/ Fritz Cr. | | Anchorage Area ^a | | Halibut Cove | | Anchor Pt./ Niniichik | | Seldovia | | Pt. Graham/ Nanwalek | | Kenai/ Soldotna | | Other | | Total Permits Issued |
|-----------------|---------------------|------|--------------------------------|------|-----------------|-----|--------------------------|------|----------|-----|-------------------------|-----|--------------------|-----|-------|-----|----------------------------|
| | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % | |
| 1979 | 276 | 62.7 | 67 | 15.2 | 2 | 0.5 | 61 | 13.9 | 3 | 0.7 | 0 | 0.0 | 11 | 2.5 | 20 | 4.5 | 440 |
| 1980 | 310 | 57.9 | 81 | 15.1 | 0 | 0.0 | 80 | 15.0 | 7 | 1.3 | 0 | 0.0 | 42 | 7.9 | 13 | 2.4 | 535 |
| 1981 | 274 | 71.4 | 43 | 11.2 | 8 | 2.1 | 37 | 9.6 | 3 | 0.8 | 1 | 0.3 | 14 | 3.6 | 4 | 1.0 | 384 |
| 1982 | 295 | 74.7 | 19 | 4.8 | 9 | 2.3 | 44 | 11.1 | 0 | 0.0 | 0 | 0.0 | 7 | 1.8 | 21 | 5.3 | 395 |
| 1983 | 267 | 77.8 | 24 | 7.0 | 3 | 0.9 | 33 | 9.6 | 8 | 2.3 | 0 | 0.0 | 0 | 0.0 | 8 | 2.3 | 343 |
| 1984 | 266 | 72.1 | 20 | 5.4 | 6 | 1.6 | 62 | 16.8 | 5 | 1.4 | 1 | 0.3 | 5 | 1.4 | 4 | 1.1 | 369 |
| 1985 | 251 | 79.4 | 15 | 4.7 | 6 | 1.9 | 33 | 10.4 | 6 | 1.9 | 0 | 0.0 | 2 | 0.6 | 3 | 0.9 | 316 |
| 1986 | 280 | 82.8 | 18 | 5.3 | 4 | 1.2 | 29 | 8.6 | 1 | 0.3 | 0 | 0.0 | 1 | 0.3 | 5 | 1.5 | 338 |
| 1987 | 284 | 78.7 | 25 | 6.9 | 3 | 0.8 | 37 | 10.2 | 7 | 1.9 | 0 | 0.0 | 2 | 0.6 | 3 | 0.8 | 361 |
| 1988 | 338 | 77.2 | 36 | 8.2 | 5 | 1.1 | 43 | 9.8 | 6 | 1.4 | 0 | 0.0 | 10 | 2.3 | 0 | 0.0 | 438 |
| 1989 | 348 | 74.7 | 36 | 7.7 | 5 | 1.1 | 51 | 10.9 | 8 | 1.7 | 0 | 0.0 | 6 | 1.3 | 12 | 2.6 | 466 |
| 1990 | 441 | 76.3 | 36 | 6.2 | 5 | 0.9 | 65 | 11.2 | 12 | 2.1 | 0 | 0.0 | 6 | 1.0 | 13 | 2.2 | 578 |
| 1991 | 384 | 81.4 | 27 | 5.7 | 8 | 1.7 | 41 | 8.7 | 6 | 1.3 | 0 | 0.0 | 4 | 0.8 | 2 | 0.4 | 472 |
| 1992 | 302 | 82.7 | 21 | 5.8 | 5 | 1.4 | 32 | 8.8 | 3 | 0.8 | 0 | 0.0 | 1 | 0.3 | 1 | 0.3 | 365 |
| 1993 | 242 | 74.2 | 25 | 7.7 | 5 | 1.5 | 44 | 13.5 | 3 | 0.9 | 0 | 0.0 | 5 | 1.5 | 2 | 0.6 | 326 |
| 1994 | 235 | 82.2 | 20 | 7.0 | 4 | 1.4 | 21 | 7.3 | 1 | 0.3 | 0 | 0.0 | 1 | 0.3 | 4 | 1.4 | 286 |
| 1995 | 191 | 81.3 | 15 | 6.4 | 7 | 3.0 | 20 | 8.5 | 1 | 0.4 | 0 | 0.0 | 0 | 0.0 | 1 | 0.4 | 235 |
| 1996 | 241 | 80.6 | 16 | 5.4 | 7 | 2.3 | 26 | 8.7 | 3 | 1.0 | 1 | 0.3 | 2 | 0.7 | 3 | 1.0 | 299 |
| 1997 | 232 | 84.1 | 13 | 4.7 | 3 | 1.1 | 20 | 7.2 | 4 | 1.4 | 0 | 0.0 | 1 | 0.4 | 3 | 1.1 | 276 |
| 1998 | 175 | 77.1 | 18 | 7.9 | 2 | 0.9 | 24 | 10.6 | 5 | 2.2 | 0 | 0.0 | 2 | 0.9 | 1 | 0.4 | 227 |
| 1999 | 96 | 65.8 | 18 | 12.3 | 1 | 0.7 | 23 | 15.8 | 3 | 2.1 | 0 | 0.0 | 4 | 2.7 | 1 | 0.7 | 146 |
| 20-Year Avg. | 282 | 75.6 | 29 | 7.7 | 5 | 1.3 | 40 | 10.8 | 5 | 1.2 | 0 | 0.0 | 6 | 1.6 | 6 | 1.7 | 372 |
| 1979-88 Avg. | 284 | 72.5 | 35 | 8.9 | 5 | 1.2 | 46 | 11.7 | 5 | 1.2 | 0 | 0.1 | 9 | 2.4 | 8 | 2.1 | 392 |
| 1989-98 Avg. | 279 | 79.1 | 23 | 6.4 | 5 | 1.4 | 34 | 9.7 | 5 | 1.3 | 0 | 0.0 | 3 | 0.8 | 4 | 1.2 | 353 |

^a After 1989, "Anchorage Area" includes Mat-Su Valley, Eagle River, Chugiak, and or Fort Richardson.

Appendix Table 28. Subsistence salmon catch in numbers of fish by species for the village of Port Graham, Lower Cook Inlet, 1981 - 1999^a.

| Year | S Chinook | A Sockeye | L Coho | M Pink | O Chum | N Total | H Dolly Varden | A Permits Reporting |
|--------------------|--------------|--------------|-----------|-----------|-----------|------------|----------------------|---------------------------|
| 1981 | 41 | 1,521 | 450 | 298 | 111 | 2,421 | 183 | 33 |
| 1982 | 107 | 820 | 602 | 858 | 183 | 2,570 | 15 | 34 |
| 1983 | 67 | 1,026 | 431 | 174 | 95 | 1,793 | 1 | 30 |
| 1984 | 27 | 2,037 | 125 | 269 | 6 | 2,464 | 0 | 23 |
| 1985 | 141 | 481 | 91 | 32 | 24 | 769 | 0 | 23 |
| 1986 | 123 | 274 | 179 | 237 | 13 | 826 | 12 | 27 |
| 1987 | 20 | 219 | 575 | 230 | 70 | 1,114 | 20 | 33 |
| 1988 | 96 | 411 | 459 | 542 | 75 | 1,583 | 18 | 27 |
| 1989 | 51 | 94 | 460 | 640 | 58 | 1,303 | 159 | 20 |
| 1990 | 211 | 524 | 803 | 1013 | 102 | 2,653 | 666 | 32 |
| 1991 | 155 | 58 | 541 | 1494 | 185 | 2,433 | 257 | 33 |
| 1992 | 129 | 98 | 475 | 745 | 178 | 1,625 | 398 | 36 |
| 1993 | 253 | 154 | 346 | 997 | 135 | 1,885 | 214 | 31 |
| 1994 | 273 | 260 | 859 | 866 | 461 | 2,719 | 1,133 | 42 |
| 1995 | 486 | 379 | 369 | 786 | 376 | 2,396 | 66 | 49 ^b |
| 1996 | 255 | 684 | 341 | 312 | 251 | 1,843 | 161 | 48 |
| 1997 | 202 | 324 | 203 | 497 | 152 | 1,378 | 57 | 25 |
| 1998 | 164 | 271 | 243 | 459 | 240 | 1,377 | 20 | 16 |
| 1999 | 383 | 360 | 427 | 150 | 214 | 1,534 | 64 | 21 |
| 1981-99 Average | 168 | 526 | 420 | 558 | 154 | 1,826 | 181 | 31 |

^a Data source: ADF&G, Subsistence Division, data files.

^b Salmon totals and permits include 3 reports from non-residents of Port Graham Village.

Appendix Table 29. Subsistence salmon catch in numbers of fish by species for the village of Nanwalek (formerly English Bay), Lower Cook Inlet, 1981 – 1999^a.

| Year | S A L M O N H A R V E S T | | | | | | Dolly Varden | Permits Reporting |
|-----------------|---------------------------|---------|-------|-------|------|-------|--------------|-------------------|
| | Chinook | Sockeye | Coho | Pink | Chum | Total | | |
| 1981 | 97 | 1,149 | 375 | 576 | 66 | 2,263 | 874 | 24 |
| 1982 | 17 | 1,534 | 891 | 2,074 | 37 | 4,553 | 75 | 27 |
| 1983 | 0 | 1,454 | 40 | 13 | 0 | 1,507 | 0 | 16 |
| 1984 | 18 | 1,225 | 385 | 404 | 0 | 2,032 | 0 | 1 |
| 1985 | 5 | 696 | 530 | 313 | 2 | 1,546 | 0 | 1 |
| 1986 | 2 | 373 | 302 | 825 | 1 | 1,503 | 144 | 17 |
| 1987 | 1 | 682 | 339 | 484 | 44 | 1,550 | 20 | 22 |
| 1988 | 8 | 610 | 385 | 1,214 | 35 | 2,252 | 70 | 21 |
| 1989 | 0 | 63 | 695 | 855 | 16 | 1,629 | 523 | 24 |
| 1990 | 54 | 638 | 614 | 1,947 | 49 | 3,302 | 2,833 | 28 |
| 1991 | 8 | 630 | 1,512 | 3,093 | 36 | 5,279 | 848 | 30 |
| 1992 | 71 | 437 | 675 | 676 | 58 | 1,917 | 1,331 | 35 |
| 1993 | 24 | 994 | 567 | 1666 | 122 | 3,373 | 577 | 25 |
| 1994 | 27 | 570 | 511 | 1113 | 43 | 2,264 | 473 | 28 |
| 1995 | 99 | 1,416 | 169 | 487 | 0 | 2,171 | 465 | 38 |
| 1996 | 55 | 1,060 | 598 | 437 | 25 | 2,175 | 221 | 27 |
| 1997 | 0 | 1 | 0 | 14 | 1 | 16 | 0 | 1 |
| 1998 | 5 | 18 | 0 | 0 | 0 | 23 | 31 | 3 |
| 1999 | 102 | 2,755 | 1,320 | 1,873 | 890 | 6,940 | 631 | 32 |
| 1981-99 Average | 31 | 858 | 521 | 951 | 75 | 2,437 | 480 | 21 |

^a Data source: ADF&G Subsistence Division files.

Appendix Table 30. Salmon set gillnet catch in numbers of fish by species and permit/effort information for the Seldovia area subsistence fishery, Lower Cook Inlet, 1996 - 1999.

| YEAR | NUMBER OF PERMITS | | | | NUMBER OF SALMON HARVESTED | | | | | |
|--|-------------------|----------|--------|------------|----------------------------|---------|------|------|------|-------|
| | Issued | Returned | Fished | Not Fished | Chinook | Sockeye | Coho | Pink | Chum | Total |
| <i>Early Season: April – May^a</i> | | | | | | | | | | |
| 1996 | 41 | 41 | 13 | 28 | 51 | 7 | 0 | 0 | 0 | 58 |
| 1997 | 19 | 16 | 12 | 4 | 44 | 19 | 0 | 0 | 0 | 63 |
| 1998 | 20 | 19 | 10 | 9 | 132 | 61 | 0 | 8 | 0 | 201 |
| 1999 | 16 | 15 | 12 | 3 | 150 | 130 | 0 | 0 | 38 | 318 |
| <i>Average</i> | 24 | 23 | 12 | 11 | 94 | 54 | 0 | 2 | 10 | 107 |
| <i>Late Season: August</i> | | | | | | | | | | |
| 1996 | 4 | 3 | 1 | 2 | 0 | 1 | 0 | 0 | 0 | 1 |
| 1997 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1998 | 3 | 2 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1999 | 0 | | | | | | | | | |
| <i>Average</i> | 2 | 2 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |

^a Season dates in 1996 and 1997 were from April 1 – May 20; subsequent years were from April 1 – May 30.

Appendix Table 31. ADF&G, CIAA, and/or CRRC salmon stocking projects and releases of salmon fry, fingerling, and smolt, in millions of fish, Lower Cook Inlet, 1984 - 1999.

| JUVENILE SOCKEYE SALMON | | | | | | | | | | | | | | |
|-------------------------|--------------|------------|-------------|-------------|-------------|----------------|----------------|------------|------------|----------------|--------------------|-----------|-------------|---------------|
| YEAR | Leisure Lake | Hazel Lake | Chenik Lake | Paint Upper | River Lower | Lakes Elusivak | Kirschner Lake | Bruin Lake | Ursus Lake | Port Dick Lake | English Bay Lakes | Bear Lake | Grouse Lake | TOTAL SOCKEYE |
| 1984 | 2.110 | | | | | | | | | | | | | 2.100 |
| 1985 | 2.018 | | | | | | | | | | | | | 2.018 |
| 1986 | 2.350 | | 0.839 | 0.500 | 0.320 | | | | | | | | | 4.009 |
| 1987 | 2.022 | | 1.000 | | | | 0.867 | | | 0.705 | | | | 4.594 |
| 1988 | 2.100 | 0.783 | 2.600 | 1.100 | 0.552 | 0.521 | 0.521 | | | 0.222 | | | | 8.399 |
| 1989 | 2.000 | 1.000 | 3.500 | 1.000 | 0.500 | 0.500 | 0.250 | | | 0.430 | | 2.200 | | 11.380 |
| 1990 | 1.750 | 1.250 | 3.250 | 1.000 | 0.500 | 0.500 | 0.250 | 0.500 | | | 0.350 | 2.400 | | 11.750 |
| 1991 | 2.000 | 1.300 | 2.200 | 0.500 | 0.250 | | 0.250 | 0.250 | | | 0.241 | 1.619 | | 8.610 |
| 1992 | 2.000 | 1.000 | 2.750 | 0.500 | 0.250 | | 0.250 | 0.250 | 0.250 | | 0.290 | 2.370 | | 9.910 |
| 1993 | 2.000 | 1.000 | 1.400 | 0.500 | 0.250 | | 0.250 | 0.250 | 0.250 | | 0.581 | 1.813 | | 8.294 |
| 1994 | 0 | 0 | 0 | 0 | 0 | | 0.300 | 0 | 0 | | 0.800 | 0.170 | | 1.270 |
| 1995 | 1.632 | 1.061 | 1.129 | 0.337 | 0.251 | | 0.251 | 0.251 | 0.252 | | 0 | 0.360 | | 5.524 |
| 1996 | 1.490 | 1.030 | 0.951 | 0.500 | 0 | | 0.250 | 0.250 | 0.250 | | 0.155 | 0.864 | 0.217 | 5.957 |
| 1997 | 2.000 | 1.000 | 0 | | | | 0.250 | | | | 0.199 | 0.788 | 2.425 | 6.662 |
| 1998 | 2.005 | 1.302 | | | | | 0.250 | | | | 0 | 0.265 | 2.021 | 5.843 |
| 1999 | 0.265 | 0.453 | | | | | 0.173 | | | | 1.149 ³ | 1.380 | 0 | 3.420 |
| AVG. | 1.725 | 0.925 | 1.635 | 0.540 | 0.261 | 0.507 | 0.315 | 0.250 | 0.200 | 0.452 | 0.377 | 1.282 | 0.682 | 6.176 |

- continued -

Appendix Table 31. (page 2 of 2)

| YEAR | JUVENILE PINK SALMON | | | | JUVENILE CHINOOK SALMON | | | | | JUVENILE COHO SALMON | | | |
|------|--------------------------|---------------------------|---------------|----------------|----------------------------|---------------------------|----------------|--------------|------------------|-------------------------|------------------|---------------|---------------|
| | Tutka Bay Hatchery | Halibut Cove Lagoon | Homer Spit | TOTAL PINKS | Seldovia Bay | Halibut Cove Lagoon | Homer Early | Spit Late | TOTAL CHINOOK | Caribou Lake | Seldovia Lake | Homer Spit | TOTAL COHO |
| 1984 | 19,560 | | | 19,560 | | | 0.080 | | | | | | |
| 1985 | 23,500 | | | 23,500 | | 0.098 | 0.152 | | 0.250 | 0.139 | 0.083 | | 0.222 |
| 1986 | 23,100 | 2,000 | | 25,100 | | 0.101 | 0.104 | | 0.205 | 0.138 | 0.072 | | 0.210 |
| 1987 | 20,500 | 3,000 | 0.295 | 23,795 | 0.084 | 0.094 | 0.104 | | 0.282 | 0.150 | 0.045 | | 0.195 |
| 1988 | 12,000 | 3,000 | 0.300 | 15,300 | 0.084 | 0.094 | 0.104 | | 0.282 | 0.150 | 0.045 | 0.060 | 0.255 |
| 1989 | 30,100 | 6,000 | 0.332 | 36,432 | 0.108 | 0.115 | 0.104 | | 0.327 | 0.182 | 0.080 | 0.143 | 0.405 |
| 1990 | 23,600 | 6,000 | 0.303 | 29,903 | 0.099 | 0.112 | 0.212 | | 0.423 | 0.180 | 0.050 | 0.123 | 0.353 |
| 1991 | 23,600 | 6,000 | 0.303 | 29,903 | 0.091 | 0.092 | 0.191 | | 0.374 | 0.180 | 0.050 | 0.100 | 0.330 |
| 1992 | 23,600 | 6,000 | 0.300 | 29,900 | 0.113 | 0.117 | 0.226 | 0.126 | 0.582 | 0.150 | | 0.100 | 0.250 |
| 1993 | 43,000 | 6,000 | | 49,000 | 0.107 | 0.100 | 0.212 | 0.100 | 0.519 | 0.150 | | 0.116 | 0.266 |
| 1994 | 61,000 | | | 61,000 | 0.106 | 0.107 | 0.192 | 0.157 | 0.562 | 0.064 | | 0.156 | 0.220 |
| 1995 | 63,000 | | | 63,000 | 0.113 | 0.036 | 0.228 | 0.124 | 0.501 | | | 0.110 | 0.110 |
| 1996 | 105,000 | | | 105,000 | 0.109 | 0.103 | 0.101 | 0.121 | 0.434 | | | 0.150 | 0.150 |
| 1997 | 89,000 | | | 89,000 | 0.092 | 0.078 | 0.216 | 0.105 | 0.491 | | | 0.120 | 0.120 |
| 1998 | 90,000 | | | 90,000 | 0.079 | 0.073 | 0.137 | 0.120 | 0.409 | | | 0.148 | 0.148 |
| 1999 | 60,132 | | | 60,132 | 0.074 | 0.079 | 0.163 | 0.059 | 0.375 | | | 0.137 | 0.137 |
| AVG. | 44,418 | 4,750 | 0.306 | 49,474 | 0.097 | 0.093 | 0.158 | 0.114 | 0.462 | 0.148 | 0.061 | 0.122 | 0.331 |

^a Sockeye release at English Bay consisted of 918,000 fry released in Nov. 1999 and 231,000 fry held over winter for release in spring 2000.

Appendix Table 32. Catch of Pacific herring in short tons and effort in number of permits by district in the commercial sac roe seine fishery, Lower Cook Inlet, 1979 - 1999^a.

| Year | <u>Southern</u> | | <u>Kamishak</u> | | <u>Eastern</u> | | <u>Outer</u> | | <u>Total</u> | |
|---------|-----------------|---------|--------------------|-----------------|----------------|---------|--------------|---------|--------------|---------|
| | Tons | Permits | Tons | Permits | Tons | Permits | Tons | Permits | Tons | Permits |
| 1979 | 13 | 3 | 415 | 35 | — | — | — | — | 428 | 36 |
| 1980 | — | — | — | — | — | — | — | — | — | — |
| 1981 | — | — | — | — | — | — | — | — | — | — |
| 1982 | — | — | — | — | — | — | — | — | — | — |
| 1983 | — | — | — | — | — | — | — | — | — | — |
| 1984 | — | — | — | — | — | — | — | — | — | — |
| 1985 | — | — | 1,132 | 23 | 204 | 7 | 12 | 2 | 1,348 | 29 |
| 1986 | — | — | 1,959 | 54 | 167 | 4 | 28 | 3 | 2,154 | 57 |
| 1987 | — | — | 6,132 | 63 | 584 | 4 | 202 | 9 | 6,918 | 69 |
| 1988 | — | — | 5,548 | 75 | 0 | 0 | 0 | 0 | 5,548 | 75 |
| 1989 | 170 | 6 | 4,801 | 75 | 0 | 0 | 0 | 0 | 4,971 | 75 |
| 1990 | — | — | 2,264 | 75 | — | — | — | — | 2,264 | 75 |
| 1991 | — | — | 1,992 | 58 | 0 | 0 | 0 | 0 | 1,992 | 58 |
| 1992 | — | — | 2,282 | 56 | 0 | 0 | 0 | 0 | 2,282 | 56 |
| 1993 | — | — | 3,570 | 60 | — | — | — | — | 3,570 | 60 |
| 1994 | — | — | 2,167 | 61 | — | — | — | — | 2,167 | 61 |
| 1995 | — | — | 3,378 | 60 | — | — | — | — | 3,378 | 60 |
| 1996 | — | — | 2,984 | 62 | — | — | — | — | 2,984 | 62 |
| 1997 | — | — | 1,746 ^b | 45 ^b | — | — | — | — | 1,746 | 45 |
| 1998 | — | — | 331 ^b | 20 ^b | — | — | — | — | 331 | 20 |
| 1999 | — | — | 100 ^c | 1 ^c | — | — | — | — | 100 | 1 |
| 20-Year | | | | | | | | | | |
| Average | 92 | 5 | 2,713 | 55 | 136 | 2 | 35 | 2 | 2,805 | 56 |
| 1979-88 | | | | | | | | | | |
| Average | 13 | 3 | 3,037 | 50 | 239 | 4 | 61 | 4 | 3,279 | 53 |
| 1989-98 | | | | | | | | | | |
| Average | 170 | 6 | 2,552 | 57 | — | — | — | — | 2,569 | 57 |

^a Data source: ADF&G fish ticket database.

^b Includes both commercial harvest and ADF&G test fish harvest.

^c Commercial fishery closed, ADF&G test fish harvest only.

Appendix Table 33. Preseason estimates of biomass and projected commercial sac roe seine harvests, and actual harvests, for Pacific herring (*Clupea pallasii*) in short tons, average roe recovery, numbers of permits making landings, and exvessel value in millions of dollars, Kamishak Bay District, Lower Cook Inlet, 1979 - 1999.

| Year | PRESEASON | | Actual Commercial Harvest (st) ^a | Average Roe % | No. of Permits w/Landings | Exvessel Value ^b (\$\$ millions) |
|--------------------|----------------------------|--|---|---------------------|---------------------------------|---|
| | Forecasted Biomass (st) | Projected Harvest (st) ^a | | | | |
| 1979 | ^c | ^d | 415 | — | 36 | ^c |
| 1980 | ^c | — | CLOSED | — | — | — |
| 1981 | ^c | — | CLOSED | — | — | — |
| 1982 | ^c | — | CLOSED | — | — | — |
| 1983 | ^c | — | CLOSED | — | — | — |
| 1984 | ^c | — | CLOSED | — | — | — |
| 1985 | ^c | ^d | 1,132 | 11.3 | 23 | 1.00 |
| 1986 | ^c | ^d | 1,959 | 10.4 | 54 | 2.20 |
| 1987 | ^c | 3,833 | 6,132 | 11.3 | 63 | 8.40 |
| 1988 | ^c | 5,190 | 5,548 | 11.1 | 74 | 9.30 |
| 1989 | 37,785 | 5,000 | 4,801 | 9.5 | 74 | 3.50 ^f |
| 1990 | 28,658 | 2,292 | 2,264 | 10.8 | 75 | 1.80 |
| 1991 | 17,256 | 1,554 | 1,992 | 11.3 | 58 | 1.30 |
| 1992 | 16,431 | 1,479 | 2,282 | 9.7 | 56 | 1.40 |
| 1993 | 28,805 | 2,592 | 3,570 | 10.2 | 60 | 2.20 |
| 1994 | 25,300 | 3,421 | 2,167 | 10.6 | 61 | 1.50 |
| 1995 | 21,998 | 2,970 | 3,378 | 9.8 | 60 | 4.00 |
| 1996 | 20,925 | 2,250 | 2,984 | 10.1 | 62 | 6.00 ^f |
| 1997 | 25,300 | 3,420 | 1,746 | 9.3 | 45 | 0.40 |
| 1998 | 19,800 | 1,780 | 331 | 8.5 | 20 | 0.07 |
| 1999 | ^g | — | CLOSED | — | — | — |
| 1979-98 Average | 24,226 | 2,982 | 2,713 | 10.3 | 55 | 3.08 |

^a Kamishak Bay allocation only, does not include Shelikof Strait food/bait allocation.

^b Exvessel values exclude any postseason retroactive adjustments (except where noted).

^c Prior to 1989, preseason forecasts of biomass were not generated.

^d Prior to 1987, preseason harvest projections were not generated.

^e Data not available.

^f Includes retroactive adjustment.

^g 1999 preseason biomass calculated as a range of 6,000 to 13,000 st.

Appendix Table 34. Summary of herring sac roe seine fishery openings and commercial harvests in the Kamishak Bay District of Lower Cook Inlet, 1969 - 1999.

| Year | Dates of Openings | Total Hrs. Open | Harvest (short tons) | Catch Rate (short tons/ hour open) | Number of Permits w/Landings |
|-------------------|-------------------|--|----------------------|------------------------------------|------------------------------|
| 1969-73 | No closed periods | | | | |
| 1974 | 1/1 - 5/20 | | 2,114 | | 26 |
| 1975 | 1/1 - 6/6 | (Closed Iniskin Bay 5/17) | 4,119 | | 40 |
| 1976 | 1/1 - 5/21 | (Closed Iniskin Bay 5/17; reopened Kamishak 6/2) | 4,824 | | 66 |
| 1977 | 1/1 - 5/31 | (Closed Kamishak Dist. 5/12; reopened 5/14 - 5/17; reopened 5/29 - 5/31) | 2,908 | | 57 |
| 1978 ^a | 4/16 - 5/31 | 96 | 402 | 4.2 | 44 |
| 1979 | 5/12 - 5/15 | 72 | 415 | 5.8 | 36 |
| 1980 through 1984 | CLOSED | 0 | 0 | | |
| 1985 | 4/20 - 6/15 | 1,350 (56.2 days) | 1,132 | 0.8 | 23 |
| 1986 | 4/20 - 6/13 | 1,303 (54.3 days) | 1,959 | 1.5 | 54 |
| 1987 | 4/21 - 4/23 | 65 | 6,132 | 94.3 | 63 |
| 1988 | 4/22 - 4/29 | 42 | 5,548 | 132.1 | 74 |
| 1989 | 4/17 - 4/30 | 24.5 | 4,801 | 196.0 | 74 |
| 1990 | 4/22 - 4/23 | 8 | 2,264 | 283.0 | 75 |
| 1991 | 4/26 | 1 | 1,922 | 1,922.0 | 58 |
| 1992 | 4/24 | 0.5 | 2,282 | 4,564.0 | 56 |
| 1993 | 4/21 | 0.75 | 3,570 | 4,760.0 | 60 |
| 1994 | 4/25 | 0.5 | 778 | 1,556.0 | 35 |
| | 4/29 | 1.0 | 1,338 | 1,338.0 | 53 |
| 1995 | 4/27 | 0.5 | 1,885 | 3,370.0 | 45 |
| | 4/28 | 1.0 | 1,693 | 1,693.0 | 44 |
| 1996 | 4/24 | 0.5 | 2,984 | 5,968.0 | 62 |
| 1997 | 4/25 ^b | 0.5 | 0 | 0 | 0 |
| | 4/29 | 1.5 | 1,580 | 1,053.3 | 42 |
| | 4/30 | 8.0 | 61 | 7.6 | ^c |
| | 5/1 | 12.0 | 51 | 4.3 | 4 |
| | 5/22 ^d | ^d | 54 | ^d | - |
| 1998 | 4/21 | 0.5 | 160 | 320.0 | 12 |
| | 4/22 | 2.0 | 136 | 68.0 | 11 |
| | 5/14 ^d | ^d | 10 | ^d | - |
| | 5/22 ^d | ^d | 23 | ^d | - |
| 1999 | CLOSED | CLOSED | 100 ^d | ^d | - |

^a Management by emergency order began.

^b Despite the open fishing period, the entire fleet collectively agreed not to fish due to ongoing price negotiations with processors.

^c To comply with AS 16.05.815 CONFIDENTIAL NATURE OF CERTAIN REPORTS AND RECORDS, effort data has been masked where fewer than four vessels fished in a given area.

^d ADF&G test fishing harvest.

Appendix Table 35. Estimates of Pacific herring (*Clupea pallasii*) total biomass in short tons using two different methods, actual commercial sac roe seine harvest in short tons, and percent exploitation, Kamishak Bay District, Lower Cook Inlet, 1979 - 1999.

| Year | Aerial Survey Total Biomass Estimate (st) ^a | ASA Model Total Biomass Estimate (st) ^{b,c} | Actual Commercial Harvest (st) | Estimated Exploitation Rate (%) ^b |
|--------------------|--|--|--------------------------------------|--|
| 1979 | 3,315 | 4,946 | 415 | 8.4 |
| 1980 | ^d | 10,729 | CLOSED | --- |
| 1981 | 5,130 | 15,056 | CLOSED | --- |
| 1982 | 4,835 | 23,761 | CLOSED | --- |
| 1983 | 4,750 | 28,002 | CLOSED | --- |
| 1984 | 6,500 | 29,404 | CLOSED | --- |
| 1985 | 13,320 | 32,055 | 1,132 | 3.5 |
| 1986 | 26,001 | 30,587 | 1,959 | 6.4 |
| 1987 | 35,332 | 28,755 | 6,132 | 21.3 |
| 1988 | 29,548 | 23,490 | 5,548 | 23.6 |
| 1989 | 35,701 | 20,643 | 4,801 | 23.3 |
| 1990 | 19,664 | 16,825 | 2,264 | 13.5 |
| 1991 | 18,163 ^e | 15,782 | 1,992 | 12.6 |
| 1992 | 24,077 | 15,369 | 2,282 | 14.8 |
| 1993 | 32,439 | 15,930 | 3,570 | 22.4 |
| 1994 | 25,344 ^e | 14,244 | 2,167 | 15.2 |
| 1995 | 25,115 | 11,762 | 3,378 | 28.7 |
| 1996 | 21,121 | 8,115 | 2,984 | 36.8 |
| 1997 | ----- | 5,582 | 1,746 | 31.3 |
| 1998 | ----- | 5,295 | 331 | 6.3 |
| 1999 | ----- | 5,764 | CLOSED | --- |
| 1979-98 Average | 18,219 | 17,817 | 2,713 | 16.3 |

^a Diverse methods have been used to generate historical aerial survey biomass estimates; after 1989, see LCI herring forecast report or statewide herring forecast document to determine specific method for individual year.

^b Figures are based on the best available data at the time of publishing and are subject to change; therefore all figures herein supercede those previously reported.

^c ASA model integrates heterogeneous data sources and simultaneously minimizes differences between observed and expected return data to forecast the following year's biomass as well as hindcast previous years' biomass.

^d No data available.

^e Due to poor aerial survey conditions, biomass was calculated from the preseason estimate of abundance, adjusted to match observed age composition samples in the commercial catch.

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